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ADMIRAL SIR FREDERICK W. E. NICOLSON, BART., C.B., Vice-President, in the Chair.

THE FURTHER DEVELOPMENT OF THE THORNYCROFT TORPEDO VESSELS.

By JOHN DONALDSON, Esq., M. Inst. C.E. (Messrs. Thornycroft and Co.).

IN the year 1877 I had the honour of delivering a lecture¹ in this theatre on "The Thornycroft Torpedo Vessels, their Construction, "Armament, &c.," and I now come before you, after a lapse of four years, to report progress, so to speak, and to tell you what has been done in the interval by way of improving those boats and rendering them better adapted for the purposes they are designed to serve.

I need scarcely remind a professional audience of the great advances that have been made of late years in the adaptation of mechanical contrivances for the purposes of war, and in the improvement of those contrivances already in use. And I think I may say that in no branch of the great military services has more progress been made than in that which concerns itself with the equipment of swift steam-vessels for use in torpedo warfare, and in the methods of using those vessels in connection with the formidable weapons with which they are armed. Most of this progress is the result of experience gained in working the boats and their armament for purposes of instruction by the Officers of the Governments who have purchased them, and little, if any, has been suggested by experience in actual warfare. In fact, with the exception of the operations on the Danube and in the Black Sea during the Russo-Turkish War, and one or two actions in the war between Chili and Peru, no opportunity has occurred for testing the value of *swift* vessels for use in torpedo warfare.

The Russian torpedo-boats used in the war against Turkey seem to have been of an inferior type, and to have had a very low rate of speed,

¹ *Vide Journal, No. XCI, page 611 et seq.*

as Lieutenant Sleeman speaks of four of them having experienced great difficulty in stemming the current of the Danube.

In 1877 I described and illustrated the Scandinavian type of boat, the Dutch and Italian type, the French types, and the "Lightning" type; these types have all gradually been developed into two distinct groups, viz., those attached to, and carried by, larger vessels, and those sufficiently large to act independently, and to a certain extent to keep the sea. The two groups may be further described, beginning with the earlier and smaller, and adopting the Admiralty classification, as the second class group and the first class group. The second class group has been developed from the Scandinavian type, and at present consists of two classes, viz., those armed with the Whitehead torpedo and those armed with the spar torpedo.

Of those armed with the Whitehead torpedo we have one variety in which the torpedo is discharged from side frames, another in which the torpedo is discharged from troughs fixed in the bows by means of a steam impulse-tube, a third in which the boat is propelled by means of a hydraulic propeller instead of the screw, and a fourth in which the Herreshoff boiler is used instead of the locomotive. The spar torpedo-boats hitherto built by us have been of the ordinary type, fitted with screw propellers. Curiously enough, not only was the Scandinavian type of boat developed into the second class torpedo-boat, but some of those built by us for the Norwegian and Danish Governments were actually sent to England and converted by us into second class boats by the alteration of their hulls and machinery.

It will be in the recollection of those interested in torpedo-boat matters that the Scandinavian boats were simply open boats, with the machinery space covered, and having the screw out behind the rudder. On being sent to us, in 1879, we altered the sterns so as to have the rudder abaft the screw, with a considerable gain in steering power, and fitted the engine-rooms with independent fans and engines for the supply of air to the boiler. The boiler of the Norwegian boat, which was too small, was removed and a larger one substituted, the result being that, although no more speed was obtained than on the official trial, that speed was more constant and could be maintained for a longer period. The armament of this boat was not altered, and I believe she still uses the towing torpedo described by me in my former lecture.

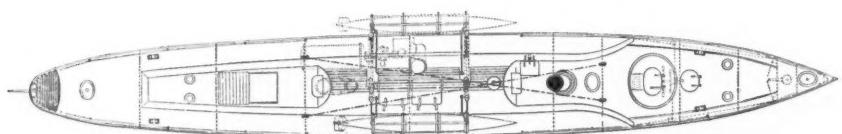
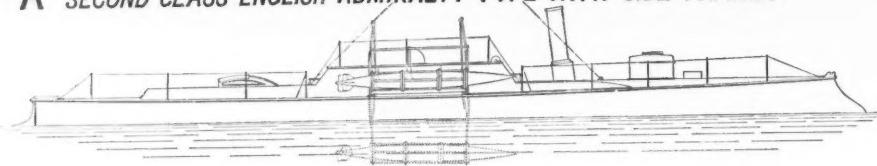
The Danish boat with her original boiler attained a speed of 15·883 knots, and her armament was altered so that she might carry and discharge a pair of 14-inch Whitehead torpedoes by means of the discharging frames invented by Mr. Thornycroft, and which are in use in all the second class boats hitherto supplied to the Admiralty. Diagram A,¹ Plate IX, represents a second class boat fitted with these discharging frames.

From the section it will be seen that they consist of a pair of davits on each side of the boat, having at their lower extremities cages which carry the torpedoes, and which are so arranged by means of a system of link work that the torpedoes may be brought from their stowed position on the side of the deck into the firing position below the

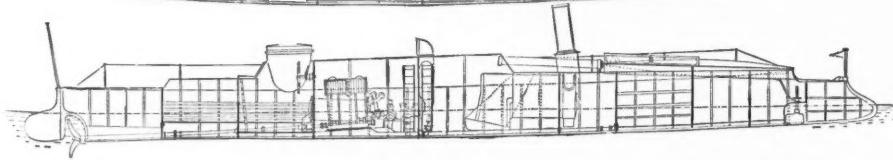
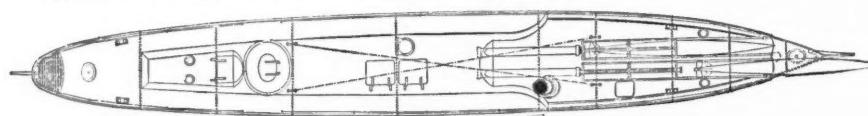
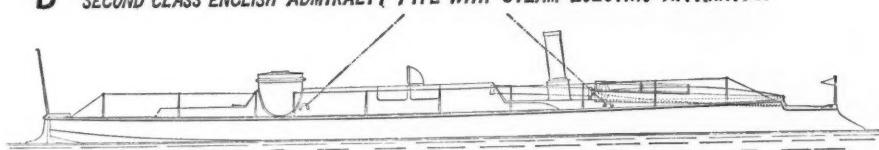
¹ The scale of the drawings is about 1 inch=12 feet 6 inches.



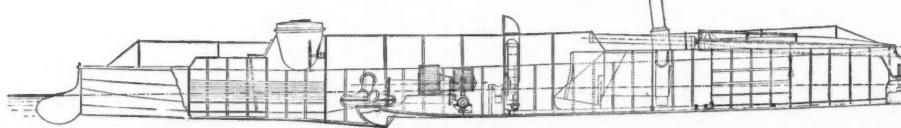
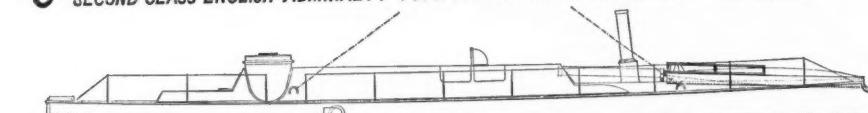
A SECOND CLASS ENGLISH ADMIRALTY TYPE WITH SIDE FRAMES.

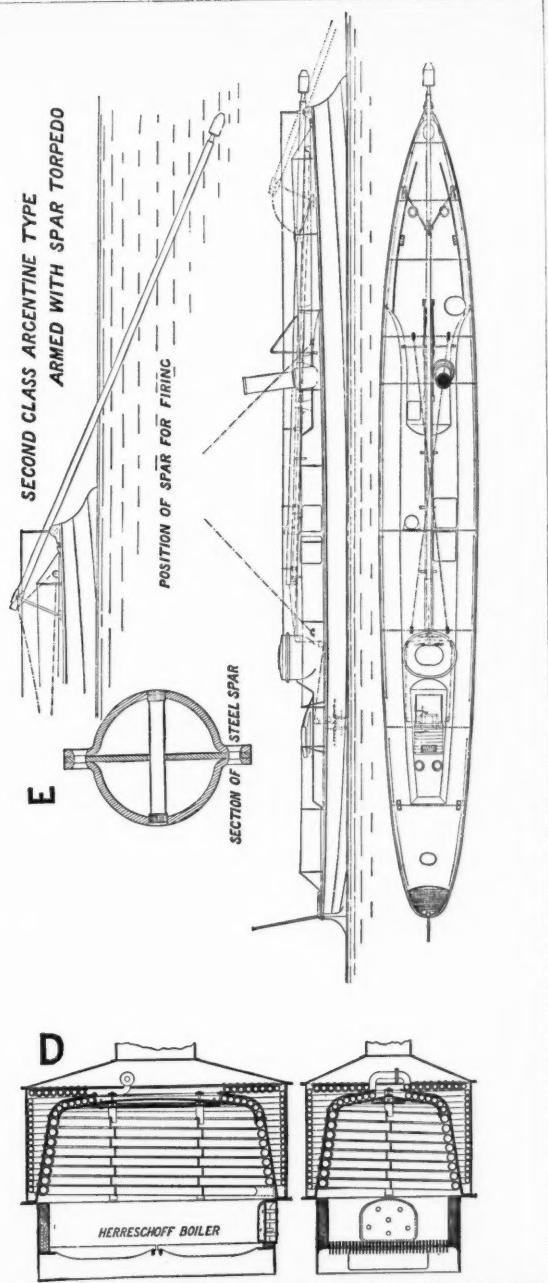


B SECOND CLASS ENGLISH ADMIRALTY TYPE WITH STEAM EJECTING APPARATUS.



C SECOND CLASS ENGLISH ADMIRALTY TYPE FITTED WITH HYDRAULIC PROPELLER.







water level, without going sufficiently far from the side to affect the stability of the boat, and without deviating in any sensible degree from parallelism to its centre line. The mechanism is shown more clearly on the model of a second class boat on the table.

The side-frame apparatus gave excellent results in practice, but according to the report of Captain Morgan Singer, of Her Majesty's ship "Hecla," it was found necessary in discharging to reduce the speed of the boat to about 3 knots, as the only means of projecting the torpedo was by setting its own engines to work to propel it out of the cage.

The first set of these boats delivered to the Admiralty differed from the second in having the stem vertical, and the engine-room not separated from the boiler-room by means of a bulkhead.

Diagram A on the wall and the model on the table represent a second class boat of the second set.

The screw-propelled second class boats we are at present building for the Admiralty are represented by Diagram B, Plate IX, and differ from the others in being a little longer than some (the length being 63 feet over all instead of 60 feet 6 inches as in the case of the first set) and in having a steam ejecting apparatus for discharging the torpedo over the bows of the boat, instead of the discharging frames. This ejecting apparatus consists of a couple of troughs on the deck on each side of the bow of the boat, containing the necessary guides for directing the course of the torpedo, and fitted at their after ends with steam cylinders $4\frac{3}{4}$ inches diameter \times 7 feet stroke, so arranged that on the admission of steam from the boiler, the piston is projected forward, and the torpedo sped on its course. The great advantage of this type of ejecting apparatus is that the torpedo may be discharged while the boat is running at full speed.

The machinery of this type of second class boats consists of a pair of direct-acting compound condensing engines, capable of developing 150 indicated horse-power, and arrangements are made by which the exhaust steam from the engines may be turned into the air in the event of the condenser being injured; and the whole of the pumping power may be applied to clear the boat of water in the event of a leak occurring, which might otherwise sink the boat. The pumping power is so great, that it is estimated that 75 tons of water may be emptied from the boat in the course of one hour, that is to say, a weight of water equal to the whole displacement of the boat could be pumped out every $8\frac{1}{2}$ minutes. This was proved in an experiment conducted by Mr. Andrews, the Admiralty Inspector in charge of the boats at the works. As will be seen by the plan on the diagram, the boats are divided into a large number of compartments by means of bulkheads and half-bulkheads, suggested by me in 1877, so that the quantity of water entering the boat in any one compartment is limited by the volume of that compartment below the line of flotation. The method of bringing the water to the pumps is by allowing it to flow through a series of valves in the bulkheads into a well in the engine-room, the passage under the boiler consisting of two pipes, so as to prevent particles of coal or ashes having access to the pumps.

Another most useful feature was introduced in 1879, when the Herreshoff boat, now at Portsmouth, arrived in this country and caused great excitement by the rapidity with which steam could be got up in her. This consisted in the insertion of what was really an injector in the bottom of the boiler, connected by means of a copper pipe to a nozzle in the deck of the boat. This nozzle was further connected by means of a pipe to the steam-pipe of the fan engine, so that when steam was brought to the nozzle from the ship's boilers by means of a flexible tube the fan was set to work, and at the same time a current of high pressure steam was introduced among the water in the boiler, the result being a very efficient apparatus for raising steam quickly (Plate XI). This apparatus was tested on No. 56 boat at Portsmouth in competition with the Herreshoff boat on the 11th December, 1879.

On this occasion the boiler of No. 56 was filled with cold water, the fires were lighted in her at 11 h. 5 m. 5 s. A.M., and in the Herreshoff boat at 11 h. 6 m. A.M., steam at the same time being turned on to the nozzle on the deck of No. 56 from the boiler of Her Majesty's tug "Manly." At 11 h. 14 m. 2 s., *i.e.*, in 8 m. 2 s., the Herreshoff boat had 90 lbs. of steam, and started out of the harbour, followed at 11 h. 15 m. 2 s., *i.e.*, in 9 m. 35 s., by No. 56 with 60 lbs. of steam. The Spit Buoy was reached at 11 h. 27 m. 56 s. by No. 56, that is, 22 m. 21 s. from the time of lighting the fires, and by the Herreshoff boat at 11 h. 30 m. 30 s., or in 24 m. 30 s. from the same epoch, so that No. 56 beat the Herreshoff by 2 m. 9 s.—an experiment so highly successful that the Admiralty ordered all the torpedo-boats then in hand to be fitted with the apparatus.

The buoyancy of the first set of boats in which the engine and boiler rooms were not separated by a bulkhead, was satisfactorily tested at Portsmouth by filling that compartment and the steering compartment with water, the result being that the boat floated satisfactorily, and much confidence in the buoyancy of the boats was thereby produced in the minds of the seamen engaged in the experiment.

The total weight of these boats with steam up and ready for service is a little over $10\frac{1}{2}$ tons, and the highest speed obtained on the measured mile in Stokes Bay was a little over $17\frac{1}{4}$ knots.

As I mentioned before, these boats are intended to be carried on board large ships, the method of slinging being from four rings on the deck, as shown on the model on the table.

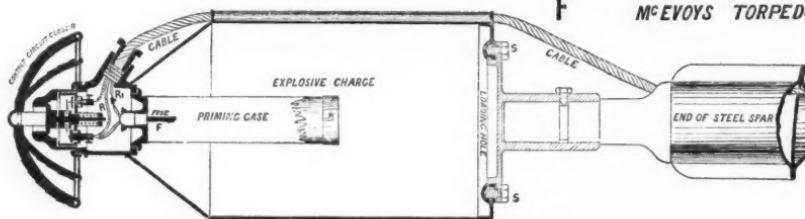
The method of slinging and the strength of the boats were most satisfactorily tested by Captain Singer in the "Hecla," who suspended one of them for twenty-hours in the slings with all her weights on board, and without doing her any injury.

This is the less to be wondered at as it was found subsequently by calculation that the stresses on the boat were less severe when suspended in the slings than when lying afloat in still water. Last year one of those unintentional experiments, or otherwise accidents, which are so useful in showing the value of really good combinations of design, materials, and workmanship, took place in Portsmouth Harbour, when one second class boat ran into another through the darkness of

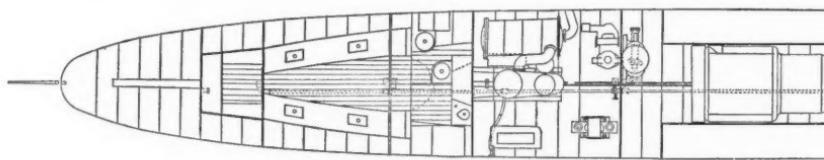
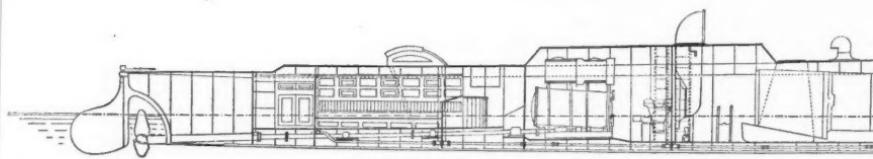
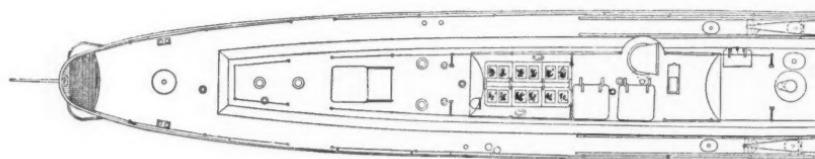
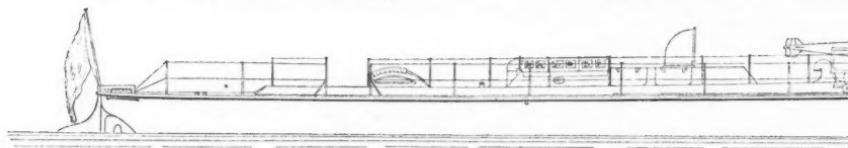


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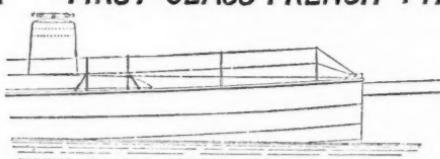
M C E V O Y S TORPEDO



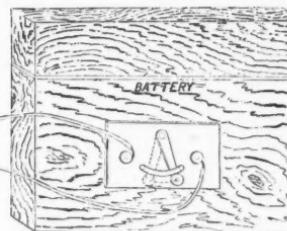
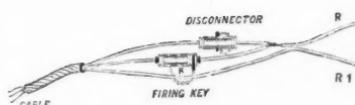
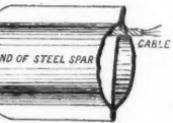
C FIRST CLASS ENGLISH TYPE WITH TORPEDO GUN & TRA



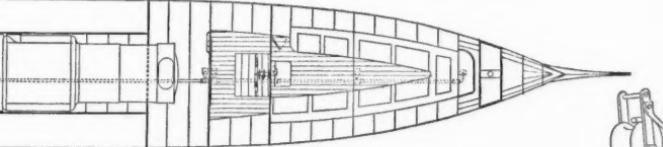
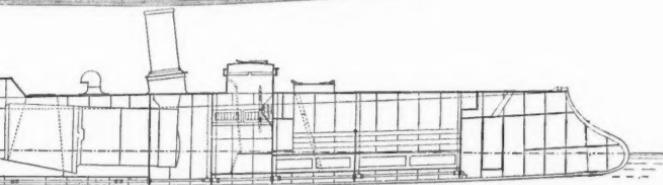
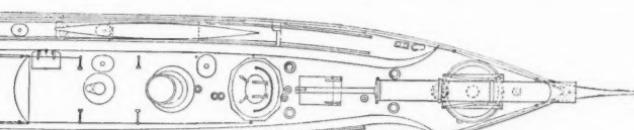
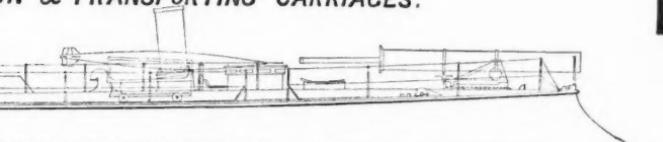
H FIRST CLASS FRENCH TYPE SHEWING BOW FITTED



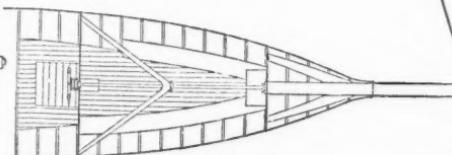
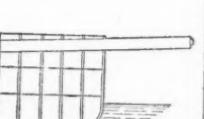
TOYS TORPEDO



WIN & TRANSPORTING CARRIAGES.



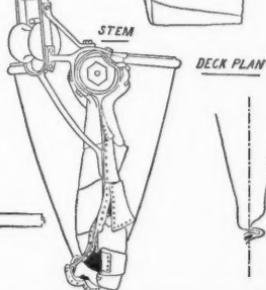
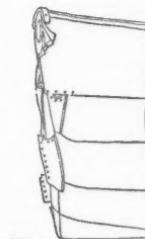
FITTED WITH BUFFER



H RESULT OF
ACCIDENT
AT CHERBOURG.

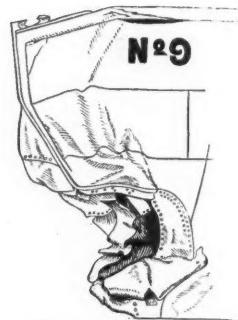
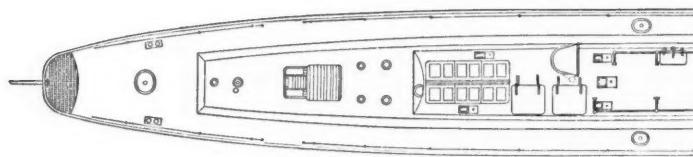
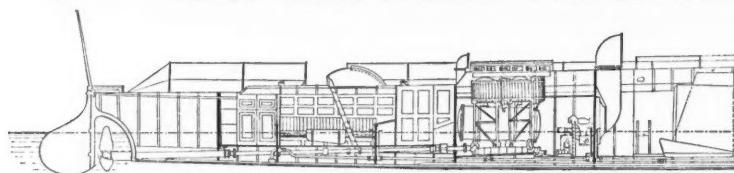


PORT SIDE



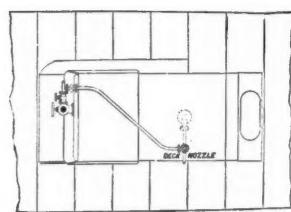
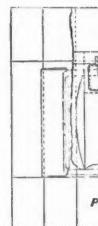
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FIRST CLASS ITALIAN TYPE FITTED

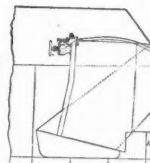
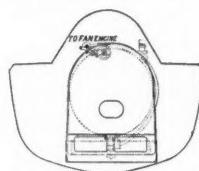


Damaged at Malta.

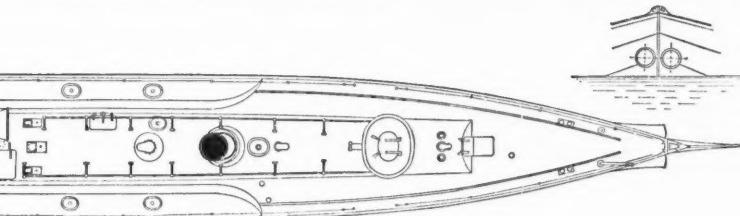
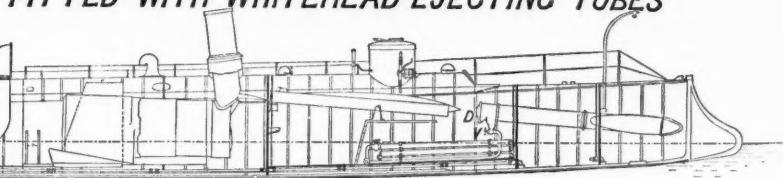
M THOR



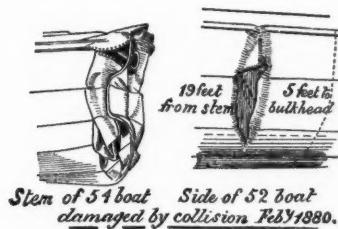
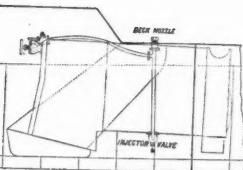
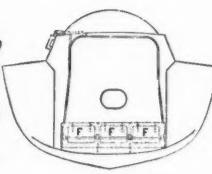
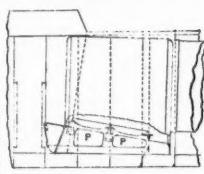
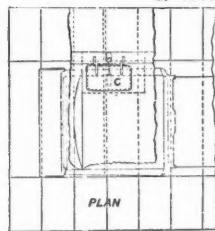
APPARATUS FOR GETTING UP STEAM QUICKLY



FITTED WITH WHITEHEAD EJECTING TUBES



M THORNYCROFTS APPARATUS FOR PREVENTING INJURY TO STOKERS IN EVENT OF INTERNAL RUPTURE OF BOILER.



Stem of 54 boat Side of 52 boat
damaged by collision Feb'y 1880.

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the night, and the inconspicuous nature of the colour she was painted, the result being a huge gash in the side of the stricken boat, which admitted the water freely into the compartment thus injured ; the boat, however, did not sink, neither was there any damage done to her pipe connections, or the machinery in the engine-room.

The colliding boat, fitted with a vertical stem, had her bow completely stove in, but no further damage was done. The results of this accident on both boats are shown in the photograph on the table (Plate XI).

All our boats are now fitted with the ram bow, strengthened so as to be useful as a means of offence in an action between boats.

I may add that the metacentric height in these boats is 8-10ths of a foot, the range of stability reaches to 79° , the maximum stability being 42° .

We now come to the type of second class boat, fitted with the hydraulic propeller, for which we received the order a short time ago from the Admiralty, and in connection with which we are at present engaged in making experiments to determine the proportions of the propelling machinery.

I do not think, however, there is much likelihood of the general design of this boat being altered, and as the type of boat is one which excites a considerable amount of interest, I think it will be well to give a description of it here.

The general design is illustrated in Diagram C, Plate IX, in which it will be seen that the part of the boat in front of the bulkhead, between the engine and boiler rooms, is exactly the same as that of the second class boats I have just described.

The boiler is exactly the same, and the only difference consists in the engine being adapted to drive a turbine instead of a screw propeller, and the necessary modifications of the hull to suit this method of propulsion.

The engine is of the compound type, laid horizontally, and having the shaft vertical so as to work the turbine without the intervention of gearing.

The turbine is kept as low as possible in the bottom of the boat, so that being always full of water there may be no difficulty in starting.

The principal objection to this type of boat, as compared with the screw propeller type, consists in the stoppage of the water in the propeller, and the consequent loss of power necessary to set it in motion again.

In the case of the screw-propelled boat, the water arrives at the screw with a velocity nearly equal to that of the boat's advance through the water, whereas in the case of the hydraulic-propelled boat, as usually constructed, the water has to be taken up and its velocity raised from a state of rest to that necessary for propelling the boat at the required speed.

An additional element of loss in the case of the hydraulic-propelled boat consists of the friction of the water in the inlet and outlet pipes.

The first of these elements of loss we have endeavoured to make good in the hydraulic boat we are now building, by turning the passage for the entrance of the water with its orifice towards the bow, so that if the vessel were pulled rapidly through the water, the water would run through this pipe and the turbine, and out at the discharge outlet with a velocity equal to that of the boat, lessened by the height to which it is raised, and the friction in the passages.

The question of the position of the outlets has not yet been settled.

The objection to having them above the water level is that some little loss would be occasioned by the extra height to which it would be necessary to raise the water.

On the other hand, if the outlets are placed below the water level, a considerable loss would be occasioned by the work necessary to drag them through the water.

The loss from this latter cause would, I apprehend, be greater in proportion in a small vessel like a second class torpedo-boat than it would be in a large vessel like, for example, the "Waterwitch."

No doubt the general idea of hydraulic propulsion is very fascinating from the great facility it affords for manœuvring, and for relieving the boat of water in the event of leakage, and the question of its adoption in practice resolves itself into a case of balancing the advantages and disadvantages, and determining which has the preponderance.

The auxiliary machinery for circulating the water in the condenser and for supplying air to the boiler will be the same as in the other second class boats.

I may say that we have stipulated with the Admiralty that the engines shall develop 100 indicated horse-power, but no speed is guaranteed, as the question is so largely one of experiment. We expect, however, that the boat will attain a speed of between 13 and 14 knots.

On giving us the order for twenty second class boats last year, the Admiralty stipulated that two of them should be fitted with the Herreshoff boiler, in order that this type of boiler might be more thoroughly tested than it was in the boat purchased by them from the Herreshoff Manufacturing Company.

As in the case of the hydraulic boat, the hull and armament will be the same as in the other second class boats, the boiler being of course different, and some modifications being necessary in the machinery to render it suitable for this class of boiler.

The boiler is illustrated in Diagram D, Plate IX, and consists of a double coil of wrought iron piping, so arranged that the feed-water is introduced at the coolest part, and becoming gradually heated is converted into steam and drawn off at the hottest part of the boiler. On leaving the boiler the steam enters a separator where all the unevaporated water is separated from the steam and blown into the hot well, whence it is returned to the boiler by the feed-pump.

Very little more water is introduced at each stroke of the pump than is necessary for the supply of steam to the engines in the interval between two successive strokes; and so, if the boiler were to burst

from any cause, there would not be sufficient steam in it to do any harm. At the same time, variations in the condition of the fire and in the demand for steam to the engines cause corresponding variations in the pressure of the steam, and a considerable amount of experience is required on the part of the stokers to ensure regular working in the machinery.

It will be readily understood that, if the engines were suddenly stopped with a heavy fire in the fire-box, the coil would stand a fair chance of being burned; and so, on receiving the order from the Admiralty, we decided that it would be necessary, so long as there was fire in the furnace, to keep up the circulation of water through the boiler.

This we proposed to do by having a separate engine for working the air, circulating and feed pumps, and arranging that when the steam is shut off from the engines it will go direct to the condenser, there to be converted into water and returned to the boiler by the feed-pumps.

The great advantage of this class of boiler is, of course, the facility and rapidity with which steam can be raised, and the impossibility of any harm accruing to the stokers from an explosion, caused either by the bursting of the tube or the entrance, say, of a Nordenfelt bullet. Bursting of the boiler from over pressure seems scarcely possible, as the tube is tested to 1,000 lbs. per square inch before being coiled, and subsequently to twice the working pressure when in the form of a boiler.

I do not expect much diminution of weight by the use of the Herreshoff boiler, as, from all I hear, it is not so economical in coal consumption as the ordinary type. This, however, will not be determined till the boats are completed, as I do not consider the boat at present in the hands of the Admiralty to be at all a good specimen.

We now come to the type of second class boat built by us for the Argentine Government.

This type is illustrated in Diagram E, Plate IX, in which, as will be seen, the armament consists of a single spar torpedo, arranged so as to be conveniently stowed on deck while the boat is running, and readily run out into the firing position on approaching the enemy. The spar is made of steel, in three pieces, riveted together, as shown in section on the diagram, and is sufficiently strong to allow of the engines being driven at full speed while it is in the firing position, and while the boat is being steered about in any direction.

The method of running the pole out is clearly shown in the diagram, the windlass for working it being in the steering compartment, and entirely under the control of the Officer in charge. The hauling-out apparatus consists of a wire rope attached to the inboard end of the torpedo spar, and passing over a pulley in the bow of the boat, so that when the wire rope is coiled on the windlass the pole is drawn forward till the preponderance of weight is beyond the bow of the boat; the torpedo then descends into the water, and the inboard end rises, carrying with it the crosshead which is attached to the deck by means of the radius rods A and B, so adjusted as to length, that when they are

in a position at right angles to the pole, the torpedo is in the requisite position for firing, that is to say, about 20 feet in advance of the bow of the boat, and 9 feet below the surface of the water.

The torpedo used on these boats is Captain McEvoy's "Improved Patent Duplex Spar Torpedo," illustrated by Diagram F, Plate X, which is a full sized section, and by the torpedo itself which lies on the table.

This torpedo is charged by taking off the ends by means of the screws S, and filling up the space round the central cylinder with cakes of damp gun-cotton; the central cylinder is filled with dry gun-cotton, and the fuze inserted at F, having been previously connected to the wires leading from the battery. The torpedo may be fired either by contact with the side of an enemy's vessel, or by hand, at the discretion of the operator.

If the end of the torpedo should strike the side of the enemy's vessel, the circuit is completed by the plate P touching the points of contact on the wire terminals, the result being that the circuit is completed through the fuze, and the charge exploded.

Should it be determined to discharge the torpedo by hand, the circuit is completed by pressing the firing key K, when the current proceeds by means of the wires R and R₁, through the fuze, and the torpedo is exploded. The battery is an ordinary Le Clanché battery of four cells.

It will be observed that this torpedo differs in several respects from that exhibited on the occasion of my former lecture. It has been improved in its contact firing arrangements, in the means of connecting the cable and fuze, and in the manner of charging. The contact firing arrangement, or circuit closer, has now a rocking in addition to a direct on-movement, thus rendering a failure to close the circuit at any angle at which it may strike almost impossible.

The contact firing arrangement may also be put in or out of action at any desired moment from the boat, whilst running, and the torpedo can always be fired at will when the battery is connected, whether the contact arrangement is in or out of action.

Through the kindness of Captain McEvoy, I am enabled to show you both methods of discharging the torpedo. I do not propose, however, actually to discharge the torpedo, as Captain McEvoy has arranged that the completion of a circuit shall ring a bell.

Before proceeding to the second group of vessels, I may remark that the Argentine boats were conveyed to Liverpool by rail for shipment to South America; and that, similarly, the English torpedo-boats destined for Portsmouth and Devonport were also sent by rail.

We now come to the second group of torpedo vessels built by us, viz., those sufficiently large to act independently, and to a certain extent to keep the sea.

The boats we have built and are building of this group consist of the English first class type, the French first class type already described in 1877, the new Italian type, and the Danish types.

The French 67 feet type of boat has not been repeated, neither have

the Dutch and Italian 75 feet types, the tendency being in all the vessels of this group to increased size.

In 1877, the only first class boat in the English Navy was the "Lightning," which I fully described in my former lecture, but since that time we have built eleven more for the Admiralty, making in all a dozen first class boats of our construction.

The best of this type is illustrated on Diagram G, Plate X, and by the model on the table.

This vessel was 90 feet 6 inches long over all, by 10 feet 10 inches beam, and differed from the others in having a ram bow, and in having the lower part of the stern frame cut away.

The machinery and fittings of this boat were much the same as those of the "Lightning," and her armament consisted of three Whitehead torpedoes, two being carried on the transporting carriages on each side of the deck, and one in the torpedo gun in the bow.

It will be observed that this gun is arranged so that it may be turned round to discharge the torpedo on either side, or directly ahead; preference, however, is given to firing from the side while running at full speed, the results being so far satisfactory that certainty of hitting may be reckoned on at 400 yards distance while running at full speed.

The ejecting apparatus consists of a telescopic impulse-tube, actuated by compressed air.

This vessel, at a preliminary trial on the Thames, attained a speed of 22·01 knots as a mean of six runs on the measured mile at Long Reach, with a load of 3·25 tons on board, and on her official trial on the 28th of February, 1880, attained a mean speed of 21·75 knots per hour under the same conditions, but with 6 $\frac{3}{4}$ tons on board.

I may say that in our contract with the Admiralty the stipulated speed was 18 knots per hour as a mean of six runs on the measured mile, and that the excess of the actual over the stipulated speed was due more to minor improvements in the hull and machinery than to any general alteration in the design, the whole of these boats being built under a strict specification finally approved in 1878. The power developed in the trial of this vessel was 469 indicated horse-power.

The metacentric height of the English first class boats is 1·675 feet, and the range is quite as much as in the case of the second class boats.

They are also as strong in proportion, and seem to stand lifting about equally well, as two of them were actually lifted on board the "Tamar," with all their machinery on board, and were transported the one to Gibraltar and the other to Malta.

The lifting was effected by means of two slings made of sennit, about 12 inches wide, formed by braiding together $\frac{3}{4}$ -inch steel-wire cords.

The slings were put under the boat at two bulkheads, and a separate purchase was used from the same crane for each sling, the parts above the boat being kept asunder by means of a spar.

The lifting (for the particulars of which I am indebted to Mr. Robinson, Chief Constructor at Portsmouth) was most successfully done, and no difficulty was experienced in discharging the boats at Gibraltar and Malta.

The boat sent to Malta was the subject of an unintentional experiment, having been run ashore at a speed of 16 knots, with the result shown in the photograph, the original of which was kindly lent me by Mr. Barnaby, Director of Naval Construction (Plate XI).

It will be observed that the boat was not injured abaft the first bulkhead.

The cause of the accident was the dropping out of a pin in the telegraph gear between the conning-tower and the engine-room, and the occurrence seems to point to the necessity of some means being provided so that the engineer may acknowledge the receipt of an order in the engine-room. This we propose to fit in all future boats.

One of the French first class boats had a worse accident at Cherbourg in 1878, having been run right into a granite wall at a speed of 15 knots.

This vessel was provided with a hydraulic buffer in the bow, so that the shock was somewhat deadened, although sufficient to produce the distortion shown on Diagram H, Plate X.

The left hand side of the diagram shows the bow of the boat before the accident, with the buffer in place, and the right hand side shows the result of the collision.

The only part of the machinery affected was the condenser, which shifted forward slightly; the rest stood the shock well. But the stoker, who at the moment was stoking his fire, was thrown violently against the boiler front with his hands and arms in the furnace, and suffered such injuries that he died shortly afterwards.

M. de Maupeau, to whom I am indebted for the original of the diagram, assures me that, with the exception of this accident and one due to the inefficient adjustment of the connecting-rod brasses on another boat, no accident has happened to any of the sixteen boats built by us for the French Navy, and they have been continually in use for instructional purposes, since we delivered them to the dockyard authorities.

In the year 1878 we built a vessel of this group, 94 feet long \times 11 feet beam, for the Danish Government, which attained a speed of 21·32 knots per hour on the measured mile, and 20·23 knots on a run of three hours' duration in the estuary of the Thames, with a load of 6·65 tons on board. The armament of this boat consisted of a single tube fixed in the bow, suited for the discharge of a 14-inch Whitehead torpedo, and similar to those to be fitted in the boats we are now building for the Italian Government. These boats are illustrated on Diagram K, Plate XI, and are 94 feet long \times 11 feet beam.

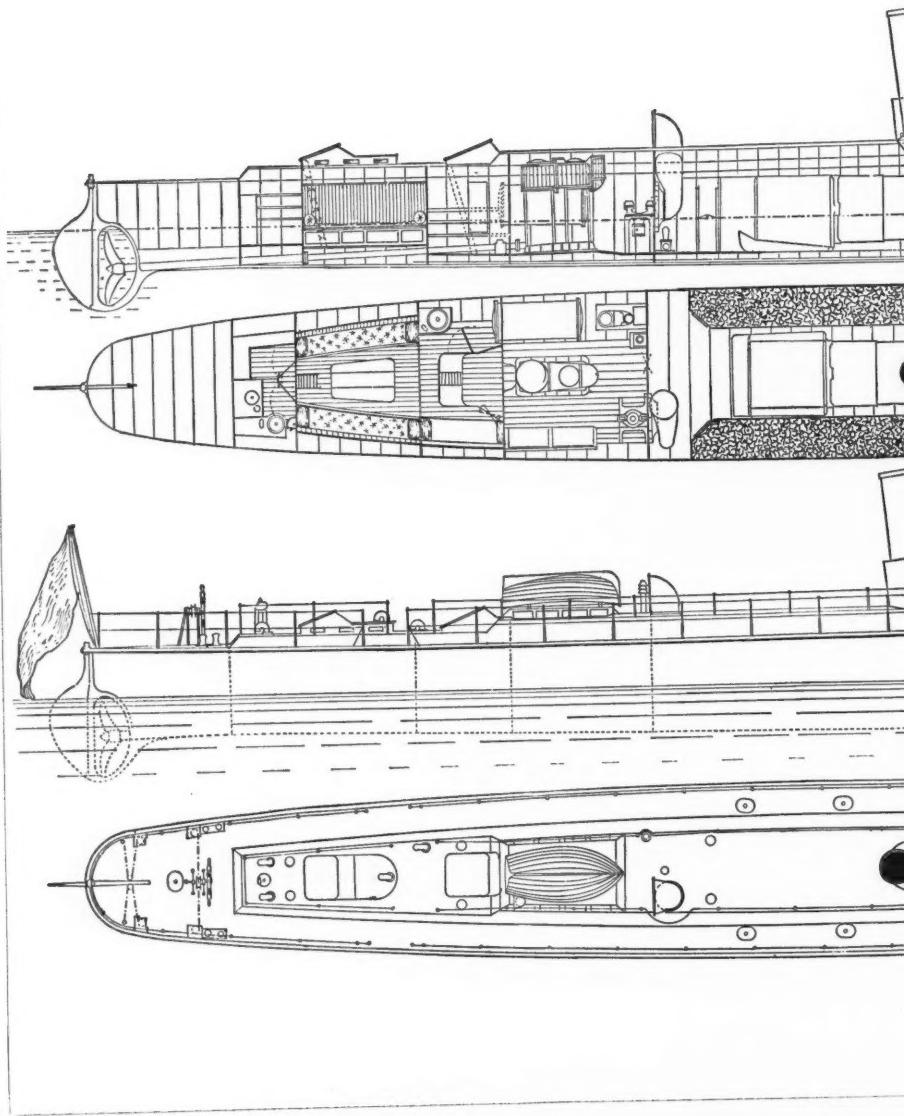
The engines are somewhat larger than those of the English first class boats, and we expect a somewhat higher speed. But the principal difference between them and the English boats is in the ejecting apparatus, which consists of two tubes of the Whitehead type, fixed, one on each side of the bow, an air-compressing pump, tubular reservoirs for containing the compressed air, and a reducing valve communicating between the reservoirs and the discharging tube.

The method of working the apparatus is as follows:—

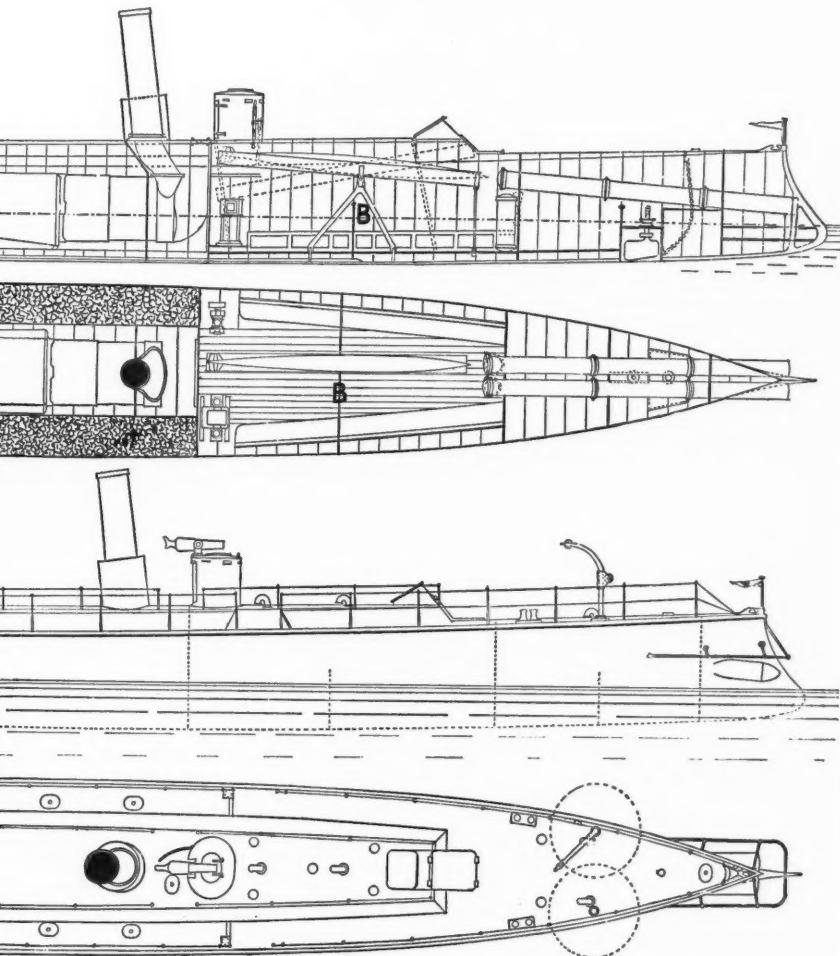


L

IMPROVED DANISH TYPE, WITH WHITEHEAD EJE



THE HEAD EJECTING TUBES FOR 19-ft. TORPEDOS.



t
t
a
f
s
f

The torpedo being placed in the tube by means of the door D, and the reservoirs being filled with air to a pressure of 70 atmospheres, the valve V is opened, and the air, reduced to a pressure of one atmosphere, is admitted to the discharging tube behind the centre of the torpedo. The torpedo itself thus becomes a piston, and is ejected at a speed of about 30 knots per hour, so as to keep well in advance of the boat when going at its highest speed.

We now come to the improved Danish type of boat, which, when completed, will, in my opinion, be the most complete and formidable type of small torpedo-boat afloat. This vessel is illustrated in Diagram L, Plate XII, and is 110 feet long \times 12 feet beam, and although we have only guaranteed a speed of 18 knots per hour on a run of three hours' duration, we fully expect that this speed will be very much exceeded on the trial.

The improvements that have been effected in her are the result of great experience and careful thought on the part of the Officers in the Danish torpedo service.

She is to be armed with two discharging tubes of the Whitehead pattern, suited for the discharge of the Whitehead 15-inch torpedo, of 19 feet in length, the Danish Officers considering it advisable, when discharging a torpedo, to discharge that containing the largest possible charge, and capable of going the greatest distance at the highest speed.

The charge in these torpedoes is 80 lbs. of gun-cotton, and they are capable of going a distance of 1,000 yards at a speed of 18 to 19 knots.

The vessel will carry four of these formidable weapons, two in the tubes ready for discharging, and two in the loading shoots, which are adjusted on radius rods, so that the torpedoes may be stowed, one on each side of the torpedo-room.

As will be seen from the diagram, the boat is carefully divided into a large number of compartments by means of bulkheads and semi-bulkheads, as in the case of the second class boats.

The torpedo-room is divided into two parts by the half-bulkhead at B, the forward part being fitted up for the use of the crew, and the after part for the use of the petty officers; both of these compartments are reached from the deck by means of separate hatchways. A double bulkhead, filled in with slag-wool, separates the torpedo-room from the forward part of the boiler-room, so that heat may not be transmitted from the smoke-box of the boiler into the torpedo-room.

The boiler is of the locomotive type usually fitted in all boats built by us, and is provided with Mr. Thornycroft's patent apparatus for preventing accidents to stokers in the event of the bursting of a tube or other sudden leakage of steam into the interior of the boiler.

This apparatus is illustrated in detail by Diagram M, Plate XI, and by the model on the table, and consists mainly of several flaps in front of the ash-pit, so arranged as to allow the air to enter freely to the under side of the grate bars, but which will close on a reduction of the pressure forcing them open. This reduction of pressure would,

of course, take place if the fire-box were suddenly filled with steam, and the valves would close so as to prevent the steam entering the stokehold.

To prevent pressure accumulating in the fire-box of sufficient amount to destroy the casing round the ash-pan, a passage, P, is provided along the outside of the boiler to the deck, fitted with a cover, C, at its upper extremity, fastened by means of a spring catch, so that an excess of pressure in the ash-pit will blow this cover open, and allow the steam to escape into the air. The fire-box door is arranged to be closed by a strong catch, so that steam cannot enter by this way into the stokehold.

One great advantage of this arrangement, independently of the safety afforded to the stokers, is that the bars can be cleared, and the fire seen to at any time while the boat is under way. I may say that on the bursting of one of the tubes in one of the Dutch boats the apparatus worked perfectly, the valves closing in the stokehold, and the cover at the upper end of the passage being opened, so that the ash-pan was relieved of all pressure, and no steam entered the stokehold.

The working of the apparatus will be readily seen from an inspection of the sectional model on the table, which is made to a scale of 1 inch to the foot.

The engines of the Danish vessel will be of the direct-acting compound condensing type, capable of developing 600 indicated horse-power; the cylinders will be steam jacketted, and everything arranged with a careful regard to economy of fuel, one of the conditions of the contract being that the boat will carry sufficient coal to steam a distance of 1,000 miles at a speed of 10 knots.

The air, circulating and feed pumps will be driven by a separate engine, and arranged so that the whole pumping power of the vessel may be applied to pump water from the bilges as in the latter type of second class boat. Aft of the engine-room, and communicating with it, is a cabin for the engineer, which may also be reached from the deck.

The cabin for the Officers in charge of the boat will be immediately aft of this, and is reached only from the deck.

In addition to the torpedo armament, a Hotchkiss gun will be mounted on the top of the conning-tower, as shown in the diagram. This gun will, I have no doubt, be useful not only as a means of protection to the boat herself, but also as a means of offence in combating the machine-guns on the enemy's deck, and, in a night attack, in destroying the electric light at her masthead.

Having now described the boats built by us in the past, and the boats at present in hand, thereby bringing the subject, as it were, up to date, I think it will not be out of place if I devote a little time to the consideration of the boats that will probably be required in the future—the still further development of the Thornycroft torpedo-boats.

To approach this question properly it will be necessary to consider

generally the conditions under which torpedo vessels may be employed with advantage in warfare, and the various obstacles they will have to encounter in attacking an enemy's ship. And here I hope that gentlemen who have made this subject a professional study will not think that I wish to intrude into their domain, and put myself forward as an authority on naval tactics.

All I propose to do is to consider the probable conditions of torpedo warfare with strict reference to the boats and their capabilities; to show what has been done, or what may be done to meet the more obvious difficulties in the way of their successful use, and then to leave the matter in the hands of those gentlemen whose business it will be to use the boats in time of war.

One of the greatest obstacles in the way of the safe destruction of ironclads and other ships of war by means of torpedo-boats is undoubtedly the machine-gun, and many people think, and even go to the length of saying, that this invention is an effectual barrier to the use of torpedo-boats. In this, however, I need scarcely say I do not agree with them.

Taking the second class boats first;—I apprehend these boats would be employed as auxiliaries to the ships to which they might be attached, and their number would be limited by the accommodation provided for them in the various classes of ships. In a duel between two large vessels they could not, therefore, be employed in sufficient numbers to distract the enemy's attention, and their vulnerability as at present constructed, and the impossibility of protecting them without materially reducing their speed, would render them an easy prey to machine-guns if they ventured to attack the enemy openly. I think, however, that by keeping up with their own ship, which their speed would easily enable them to do, and keeping to the safe side of her, they would find many opportunities of launching their Whitehead torpedoes while the enemy's ship was enveloped in the smoke from her own guns;—might even find an opportunity of using a spar torpedo in these circumstances if they were armed with that weapon.

The effect of the smoke from the guns may be imagined from an inspection of the sketch on the table, which represents Her Majesty's ship "Inflexible" at gun practice.

In a combined expedition against a solitary vessel by the torpedo-boats of a squadron, which I fancy would take place at night, the number of boats employed, by distracting the attention of the crews at the machine-guns, and the darkness contributing largely to this by preventing them from knowing if their aim were accurate, would more than counterbalance the rapidity of fire and the penetrating power possessed by these guns.

Of course the electric light on the ship would help her largely, while it lasted, against the particular boat towards which it might be directed, but if the ray were removed in another direction, that boat would be safer than had the light not been there. Gentlemen who have had to navigate vessels where the electric light has been employed, will appreciate the immense difficulty of seeing anything beyond the area illuminated by the light.

It would be prudent, however, to destroy the electric light, if possible, by means of machine-guns on board one or more of the attacking boats.

I question whether the machine-guns in point of accuracy, rapidity, and penetrating power are more effective in proportion to the speed and vulnerability of the boats employed than were the rifles used during the American War, and manned by a whole ship's crew, the boats employed there being simply open wooden boats; and yet several large ships were sunk in those days.

Obstructions in the water, such as nets, would undoubtedly foul the screws of these boats and place them *hors de combat*, as was the case with the "Lightning," which was hung up from 9 o'clock in the evening till 5 o'clock the next morning, by an obstruction of this kind, on the occasion of the night attack at Portsmouth, on the 16th of October, 1879. But this might be got over by protecting the screws with bar gratings, or by using Mr. Thornycroft's patent propelling apparatus, which has been applied to the "Lightning" with great success.

This latter appliance, by being of considerably less diameter than the ordinary screw-propeller, would also enable the boats to run in shallower water, if necessary, but this would scarcely be required in the case of an attack on a ship.

Booms and obstructions of that class might be cleared by means of spar torpedoes.

From these considerations it appears to me that the second class boats may be considerably improved by having an alternative armament of Whitehead torpedoes, spar torpedoes, and machine-guns; and by having the screw protected in either of the ways suggested. The commander of a squadron would then be enabled to make up a torpedo boat expedition of :—1st. Boats armed with the Whitehead torpedo for operating at, say, 400 to 600 yards off the enemy; 2nd. Boats armed with the spar torpedo for removing spars and other obstructions; and 3rd. Boats armed with machine-guns to operate upon the enemy's electric light, and to cover the advance of the boats with the spar torpedoes, should circumstances lead the commander of the expedition to consider the use of this weapon necessary or advisable.

The machine-gun armament would also enable the commander of a ship to use all the torpedo-boats on board as picket boats when in a position where he might be liable to an attack from the enemy's torpedo-boats. Their great speed and ramming power would, in such a case, be invaluable in preventing the enemy's boats taking up such a position as would enable them to discharge their torpedoes with effect.

It may be that the present second class boats are too small to be used in this way, and to afford a sufficiently steady platform for the machine-gun; but this difficulty may be got over by using the next larger size of boat, viz., that built for the French and Austrians, which was 67 feet long \times 8 feet 6 inches beam, and which attained a speed of 18 knots on a run of two hours' duration.

The great objection, of course, is the weight, but I think naval

architects and naval Officers could easily manage the 15 tons which would be about the displacement of these boats.

The difficulties in the way of using second class boats seem to apply with greater force to first class boats, as they would be largely used in the defence of our coasts and harbours, and might have to attack in circumstances where the advantage would appear to be more on the side of the enemy than of the boats.

At the same time, as these boats have not to be carried on ships, the number available for such an attack might be greater, and as weight is not so much a consideration as in the case of the second class boats, special arrangements might be made to enable them to deal on more favourable terms with the more formidable of the enemy's appliances. These are, undoubtedly, the machine-guns; and the circumstances in which the boats would appear to have the least chance of coping successfully with the enemy would be in attacking him on a clear day when he is on his guard and ready to repel the attack.

The number of machine-guns which a ship can carry is limited, as it takes five men for a gun's crew, but what the limit is for each class of vessel I am not in a position to say. Captain Hopkins, of Her Majesty's ship "Excellent," says in a report on these guns, and their practice against dummy torpedo-boats, that frigates and broadside ironclads ought to carry two machine-guns on each side, in addition to one on the bow, and one on the stern, so that one of these vessels would carry six machine-guns.

Now, in Mr. Nordenfelt's paper of June 28th, 1880,¹ read at this Institution, he speaks as if one of his anti-torpedo-boat guns would be required to combat one torpedo-boat, so that six guns would make an attack by six torpedo-boats in the daytime at and under 300 yards almost an impossibility. But why should we limit the number of boats to six? Taking capital for capital, an ironclad costing 600,000*l.* might be met by 75 first class torpedo-boats, costing 8,000*l.* each, on going into action with three Whitehead torpedoes on board, and I think there would be little doubt of the fate of that ironclad, with a much less number of enemies than is here assumed.

But why go so close as 300 yards?

Captain Gordon, of Her Majesty's ship "Vernon," considers 400 yards as a distance at which he can use the 14-feet Whitehead torpedo with certainty; and Count Hoyas informs me that one of Messrs. Whitehead's more recent 19-feet torpedoes, containing a charge of 80 lbs. of gun-cotton, and capable of running 1,000 yards at the rate of from 18 to 19 knots, would without doubt hit a vessel of normal size, under good conditions, with the torpedo vessel at that distance.

Captain Hopkins says in his report:—"It was remarked by observers, who were in boats ahead of the targets during the end-on runs (Nos. 5, 6, 7, and 8), that although the fire at first (more particularly in the case of runs 5 and 6, and between 1,500 and 1,000 yards) was somewhat wild, several volleys and shell falling consider-

¹ *Vide Journal, No. CVIII, page 785 et seq.*

"ably beyond, and others short of the mark (although even then some rounds were effective), yet directly the range and variation in elevation due to change of distance was obtained, the effect of the fire did not seem to be influenced much by the nearer approach of the gun-boat."

From this it would seem that at the longer ranges the practice of the machine-gun is not by any means certain, and this with a velocity of only 8 knots. What would be the effect with a velocity of 20 knots?

Again, Mr. Nordenfelt says that with his anti-torpedo-boat gun, with steel bullets weighing a little less than $\frac{1}{2}$ lb. each, and an initial velocity of 1,400 feet, the maximum thickness of steel plate he could penetrate at 200 yards, with 20° angle, was $\frac{3}{8}$ -inch.

Now from all this I gather that six torpedo-boats attacking an ironclad with six machine-guns would run very little danger of being hit at 1,000 yards, and would be able to discharge six 19-feet Whitehead torpedoes against the ironclad, with a certainty that nearly all of them would hit, and that if these torpedo-boats were protected by means of $\frac{3}{8}$ -inch plate, laid at an angle of less than 20° , which there is no difficulty in doing, they might run up to within 400 yards and discharge the 14-feet torpedo, according to Captain Gordon, with almost absolute certainty of hitting.

It is to be remembered also that in running from 1,000 yards to 400 yards, a distance of 600 yards would be traversed, equal to a run of only one minute at a speed of 18 knots.

Machine-guns ought of course to be mounted on the conning-towers of the torpedo-boats, and I doubt not they would add greatly to the safety of these boats by distracting the attention of the crews of the machine-guns on the ironclad.

With regard to this matter, an account appeared in the "Army and Navy Gazette," a short time ago, which stated that three Chilian torpedo-boats, armed with spar torpedoes and Hotchkiss guns, attacked a Peruvian decked gun-vessel, carrying two guns and twenty or thirty men, the result being that the Peruvian had to run for shelter to the shore batteries, after sinking one of the boats. The report concludes by stating that if the Chilians could have prevented the gun-vessel from reaching the protection of the shore batteries, they would probably have taken her by simply clearing her deck of men.

Suppose, now, that before the next great naval war in which we may be engaged takes place, all our rivers and harbours are properly protected by torpedo-boats. An enemy's ship, or even fleet, appears at some part of the coast and is reported by telegraph to the neighbouring torpedo-boat depôts. A scheme of attack is at once organized, and, with a sufficient number of boats, I think the fate of the hostile vessels would be sealed. They would never leave the shores of England.

Of course a system of defence by means of torpedo vessels means preparation and organization. The first of these we are prepared to take part in, the second is the work of the naval authorities.

The French have at present between thirty and forty torpedo-boats

at Cherbourg alone, and an admirable system of training, by means of which most of the seamen of the War Marine are instructed in the use of torpedoes and torpedo-boats. Why should we not follow their example, not only for home defence, but also for the defence of our colonies, which would suffer so much in the event of our being at war with any great naval Power?

The improvements I would propose for the first class boats are protection in front by means of $\frac{3}{8}$ -inch plate below deck and $\frac{1}{4}$ -inch above deck in front of the conning-tower, at such an angle as would prevent penetration at distances from 400 to 1,000 yards; armament with machine-guns, and with the spar torpedo, as in the case of the second class boats, and a protection for the screw.

As I remarked in the earlier part of my lecture, we are largely dependent on naval Officers, who work these boats, for suggestions as to their improvements, and I trust that those of my audience who are interested in torpedo-boat matters will not hesitate to mention anything which occur to them tending in this direction.

In conclusion, I beg to tender my thanks to the Council for the opportunity they have given me of again bringing this subject to your notice, and to you, gentlemen, for your patient attention to my discourse.

Captain CURTIS, R.N.: I am very glad Mr. Donaldson mentioned the fact with respect to the protection of the screw, and also reminded us of the accident that took place off Fort Monekton. I think if a number of torpedo-boats go into action with their screws unprotected, whether to cut out a vessel in an enemy's port or to attack a vessel as Mr. Donaldson suggested, and the enemy throws out a number of Manilla ropes slightly weighted so as to be two or three feet under water, we shall hear a good deal more of these torpedo-boats being hung by the tail from 9 o'clock in the evening until 5 o'clock the next morning. I was told at Mr. Halsey's yard, at Wandsworth, that a simple ring placed round the screw would cut oziere as thick as your finger, and so clear itself of weeds in the Thames. It has just the action of the grass-cutter, and the screw clears its own way. I should like to ask Mr. Donaldson if he finds that these vessels steer much better for having the keel off. My own opinion is that they do steer very much better. Mr. Donaldson I understand says the screw meets the water at the same speed that the ship is going. The screw, of course, goes the same speed the ship goes, but I always understood that the water followed the ship up, and consequently that the water was running against the screw, filling the space the ship has made in the water, and the screw forcing the water back partially, but I may be in error. With respect to torpedo-boats attacking vessels, having retired for a number of years, I have never been on board a torpedo-boat, though I read about them occasionally; but I should think your better chance is going as near the vessel as you can, not keeping stationary in range of the guns, and always being on the move. I should never recommend a torpedo-boat to stop 300 or 400 yards off the ship; you would find there would be very little of her left. In the case of two fleets attacking, the time for the torpedo-boats will be when the ships are enveloped in smoke, or when they are ramming. Then I think the torpedo-boats will come in when two ships are jammed, or in collision. If you have your torpedo-boat lying on the off side she will come round and ram the other ship; that is where I think torpedo-boats will come into play, otherwise they will be engaging one another. These are no doubt magnificent models to look at, but I think there is no doubt engineers might be able to foreshorten these vessels, and give us the same speed and a more buoyant vessel in a seaway. Of course, it would be presumption for me to make any suggestion as to the form of the boat, but I should prefer a little more swell where the quarter is fleeted further about two-fifths from the bow forward.

The way to arrive at the best position for twin screws is to observe the motion of the swan or duck; you will find that they will strike out on the same line, or either side, in a direct line from under the wing, and I think it is there that twin screws should be placed in a line with the outer bilge of the ship. I would also suggest that you have the torpedo spars in falling davits, with a small derrick to top them. Then when you are not in action you have the spars up above the boat rigged in if necessary, and when you are in action or coming to close quarters you let it fall. Then there is no outrigging or inrigging optional, and you can carry more torpedoes, and more firmly fixed; when manoeuvring with other boats the spar torpedoes could be rigged in as far as steam to clear boats, funnels, &c.

Captain LINDEN, Russian Naval Attaché: In connection with the very interesting paper just read by Mr. Donaldson, I beg permission to say a few words with reference to "Batoum," the torpedo-boat built by Messrs. Yarrow and Co. for the Russian Government. "Batoum" steamed direct from London to Nikolaeff, covering the distance of 4,805 miles in eighteen days, exclusive of stoppages, with average speed of 11 knots; she was tried under all circumstances of weather and sea, and I expect, therefore, that a few words about the performances of the boat will not be without interest for the members of this Institution. "Batoum" is 100 feet long, 12 feet 6 inches beam; her draught of water with torpedoes on board is: forward, 2 feet 8 inches; aft, 4 feet. She has ram bow; bow and stern rudders and two tubes for launching Whitehead torpedoes of large size, 15 inches diameter. The indicated horse-power of her engines being nearly 500. The boat has also two jury masts with a spread of canvas of about 500 square feet; these were provided to ensure the safety of the boat in case of emergency; the boat steamed round to Nikolaeff, calling at Plymouth, Brest, Ferrol, Lisbon, Gibraltar, Algiers, Bona, Messina, Brindisi, Fiume, Sira, Constantinople, and Nikolaeff. At Fiume she had her torpedo gear fitted on board. The runs from port to port did not exceed in distance 450 miles, consuming about 10 tons of coal, all that she could carry; pressure of steam in boilers never rising above 60 lbs.; the moderate speed and pressure were maintained to avoid any straining of the engines and boiler, and to bring the boat in good order to Nikolaeff. The boat met rather rough weather in the Bay of Biscay, but she behaved on the whole well, not giving much anxiety to the crew; the steering was occasionally difficult, the boat lurching to a great extent, specially when running before the wind and sea; it was found also that the bow of the boat has not sufficient buoyancy; it rises with difficulty on the sea, and occasionally the waves would pass from end to end of the boat; to remedy this defect Commander Zatzarennyi, who had charge of it, recommends making the bow in future boats with fuller lines, and providing them with vertical keels about 9 inches high; this keel, he thinks, will diminish the propensity to lurching and will ensure better aiming when firing torpedoes. Before "Batoum" left England she was inclined and careful calculations made of her stability. Her metacentric height was found to be 21 feet, with displacement of 48½ tons. The maximum stability is reached at the angle of 50°, and at the angle of keel of 16° the gunwales begin to be immersed in the water. The passage to Nikolaeff was made quite safely and without any accident; the great source of discomfort was the very high temperature during hot weather in the engine-room, the thermometer indicating sometimes as much as 160° F., notwithstanding the continual wetting of the deck over the engines to keep it cool. When "Batoum" arrived at Nikolaeff her engines and boiler were examined and were found to be in excellent condition; the boat was hauled up on the slip, her bottom thoroughly cleaned and painted; after this she was taken upon the measured mile for a trial in her full "war equipment," with two torpedoes in the tubes, two spare torpedoes on the deck, and seven tons of coal. The mean speed of two runs was only 15½ knots, whereas in the Thames, on the trial of the boat without weights on board, the speed was over 22 knots. From the table giving the particulars of these two comparative trials, it will be seen that with the increase of mean draught by 7 inches, the speed has fallen by the same number of knots; this is a startling fact and shows how useless are the extreme speeds at which torpedo-boats are run on their first trials, when light.

Place of trial.	Pressure of steam.	Vacuum.	No. of revolutions.	Draught of water.		Mean speed.	Remarks.
				Forward.	Aft.		
London	119	25 $\frac{1}{4}$	392	2 1	3 6	22·16	Sea smooth.
Nikolaeff ...	115	26 $\frac{1}{2}$	332	2 8	4 0	15·25	Smooth.

As the necessary accessories of the torpedo gear, the "Batoum" was provided with two accumulators or cylindrical reservoirs for compressed air and with an air-compressing pump; an opportunity was taken to test these apparatus and a run was made from Nikolaeff to Odessa and back; it was found, at the end of the trial, that almost all the air escaped from the reservoir, and that the waste could not have been filled by the air-compressor, as the working of the pump when under way was almost impossible; the defects mentioned are accounted for by the great vibration of the boat, produced by the two-bladed propeller; this vibration affecting the valves of the accumulator. It was found also desirable to have the regulating valve, which admits the air into the tube, fitted on the top instead of the bottom of the tube, as the water would penetrate sometimes into the tubes and reach the valves, thus interfering with the firing of the torpedoes. "Batoum" has seven watertight bulkheads, each compartment formed by them being emptied by a separate ejector; these ejectors were not found to work quite satisfactorily; on one occasion a forward compartment was filled with 2,700 gallons of water, and it required the use of two ejectors during 40 minutes to pump out the water; from this it will be seen that one ejector throws out about 35 gallons of water per minute, which, of course, cannot be considered as good work. These ejectors served, however, as a very efficient warming apparatus during the cold days of November, the steam being turned on into the pipes. Limiting myself to these short observations, I would like, in conclusion, to ask Mr. Donaldson if he considers it possible to build a boat about the size of "Batoum," which, without the extreme speed of 22 knots on a measured mile, could maintain a moderate speed of 17 or 18 knots during a certain length of time, say 7 or 8 hours.

Captain McEvoy, in response to a call from the Chair, said: After the very interesting paper we have heard I do not think I have anything of importance to add. I may, however, remark that it seems strange in the transitions of modern warfare that the huge ironclad should find in the tiny torpedo-boat its most deadly enemy. Certainly this invention has compelled its monster antagonist to provide itself with all known appliances for defensive purposes, such as nettings, booms, electric lights, and machine-guns. I agree with Mr. Donaldson that machine-guns form a very formidable factor in the arrangement of torpedo-boats and the warfare in which torpedo-boats perform a part. I agree perfectly that the importance of the torpedo-boat would be enhanced by enabling it to use a variety of weapons, to launch the Whitehead, to use the spar torpedo, the Harvey torpedo, and to use machine-guns. I certainly do not think the use of the machine-gun should be confined to the ironclad, because the torpedo-boat when armed with the machine-gun would be placed more on an equality with the ironclad. In the night time particularly, a machine-gun on a torpedo-boat would be able to destroy the electric light, without the aid of which the machine-guns on the ironclad would be of very little use except at close quarters, because they could not see the boats without the light; and if the light was destroyed by these long-range guns at a distance far beyond that at which the light would be able to discover the approach of danger, that would give the torpedo-boat a great advantage. I can only say, in conclusion, I have been very much gratified by the very interesting paper which has been read.

Mr. NORDENFELT: My name has been mentioned by Mr. Donaldson, but still I do not know that I ought to say anything, because I am not an opponent. Really I like the torpedo-boat, and if I did not make guns I should like to make torpedo-boats. In the first place, I think torpedo-boats have their greatest chance

in the fact they are approaching a ship when you are not ready for them. I believe machine-guns have a good chance of destroying torpedo-boats if the attack is made in full daylight and fair weather; but still there are many different occasions at sea—mist, bad weather, rain, darkness—when the torpedo-boats would be able to attack favourably and would be able to see the hull of the big ship when you could not see them. Mr. Donaldson says we spoke about six guns for each big ship. I do not limit the big ship to six guns. It is true you want a certain number of men at each gun, but if you have a great number of guns on each side, torpedo-boats will probably attack on one side, and these men could change from gun to gun. Five men are supposed to be wanted for a machine-gun, but probably in case of extremity one man would handle any machine-gun, whether the Hotchkiss or my own, or anybody's else. As for the protection of torpedo-boats, I may be out of order by saying I do not believe in it at all. I believe in handiness and great speed and their being everywhere about; a great many boats attacking a big ship they have much more chance of doing harm than they would in protecting themselves and losing handiness and speed. We fired the other day at Portsmouth through 1½-inch steel at 300 yards, and I think we are prepared to meet any thickness that is feasible to be put on a torpedo-boat. It is quite true that the bigger the gun gets, the less quickly it fires; but then that tells rather in favour of the gunmakers, because a greater number of guns is required in order to fire so many shots per minute. I think the great advantage of a torpedo-boat is its wonderful handiness and marvellous speed. People talk generally as if you had only to attack a ship blockading a port—that is only one small part of what you have to do. You may have to attack at sea, and in rivers, and in all sorts of positions, and the very great advantage of these boats is their marvellous handiness considering the speed they do have. If the index could be increased all the better, but at the present moment I think the speed is the great thing. I come now to the distance question. Mr. Donaldson says, "Why speak of 300 or 400 yards?" Simply because the machine-guns do combine at that range great power of penetration with great chance of hitting. There is no reason if you have plenty of ammunition why you should not waste it at long ranges, but at 300 or 400 yards you approach the maximum of penetration, and that is the point where you would deal with the torpedo-boat. You would fire at long range if you could, but when you got to short range, you would pour a tremendous amount of fire into her. Mr. Donaldson rather holds up Mr. Hotchkiss' gun; that is no doubt quite natural, because Mr. Hotchkiss' gun is, I think, less dangerous to a torpedo-boat. Another point I wish to come to is this. The Danes are said to have Hotchkiss guns on their torpedo-boats. I do not agree with the Danes in that point. I think the gun with which the torpedo-boat is armed should be a gun which does not fire shell or big shots with penetrative power. The smallest possible lead shots will destroy the electric light if they hit it; therefore the point is to hit it; and from all the results arrived at by English Committees lately, it seems that the machine-guns which fire the rifle cartridges have the most marvellous power of hitting; therefore I should think that the gun firing an ordinary rifle bullet with immense rapidity would be the arm to destroy the electric lights, and not the penetrating gun. I believe that gentlemen who devote their time to developing torpedo-boats are doing a great amount of good, but that a very great deal remains to be done yet.

Count G. HOYAS (Messrs. Whitehead and Co.): I have had the honour of listening to Mr. Donaldson's very interesting and carefully worked-out lecture, but I should not like what has been said on the question of distance for the 19-feet torpedo to be misunderstood. It is simply meant in naming the distance of 1,000 yards that it was the outside limit at which we have run this torpedo in straight lines, with pretty good success as far as hitting goes. I did not mean that it should be accepted as the proper launching distance, because it would depend too much on the chance of fine weather and good launching as to whether you could hit; but the distance to which this torpedo now runs, and which has always given very good results, is 2,500 feet. I am sure if it was required to travel 1,000 yards it would be very easy for Mr. Whitehead to improve and arrange this torpedo, to be practically used even for such distances. If torpedoes were set for the distance of 1,000 yards instead of 400, which is now accepted as the normal firing (launching) distance, it would always be much easier

for torpedo-boats to have a good success, in being able to launch the torpedo at any distance under 1,000 yards, according to opportunity. I think it most important, now that we have to deal with those powerful and dangerous machine-guns, not to stick to short distances. You will get a much better result for torpedo-boats and sooner achieve your object, if you increase the launching distance instead of having to bring those boats right in the destructive range of the machine-guns (and therefore risk losing boat and armament before you are able to make use of your torpedo). I do not think we shall ever be able to neutralize perfectly the destructive effect of the machine-guns, but every little thing that can be done is wanted to make it more difficult to use them effectively. I should like to refer to Captain Linden's remarks about the torpedo-launching arrangements of the "Batum." He gave reason to believe that through the vibration of the boat the launching arrangements might get out of order, so that after being in action for two or three hours the whole arrangement would not work any more, as it happened on board the "Batum," and this simply by the total loss of air-pressure in the accumulator, which, if I understood rightly, could not be kept up by the compressing pump, which worked also badly under the vibration. The accumulator used in the "Batum" is a simple steel cylinder (with two bottoms screwed and soldered tightly in), and the escape of air is only possible through one pipe and its valve. If the valve hitherto applied is not sufficiently tight, it is a very easy matter to find one that will shut perfectly, even under the greatest vibration of the boat. With reference to the water getting into the launching tube when the outside door is removed from its mouth (which really is the case) and depositing itself on the top of reducer, I cannot see how that little amount of water (or even any amount) could prevent the launching; because the pressure admitted through that reducer in the launching tube is over one atmosphere, and will therefore simply blow the water away, and work on the torpedo exactly as if there had not been a drop of water there; but if it were the case, although I never saw anything of the kind, and I have seen a great many experiments in this respect, there would be no difficulty at all in placing the reducer either on one side or on the top of the launching tube, as proposed by Captain Linden.

Captain EARDLEY WILMOT, R.N.: I think we are rather drifting away from the subject of the lecture, although, no doubt, it is very interesting to hear remarks as to the relative merits of machine-guns and torpedoes. The lecture has been very interesting, as showing the development of torpedo-boats, but I think that we are a long way yet from the perfect torpedo-boat. In the Navy the second class boats are not in very great favour. They have speed, but are long and rather unhandy boats for sea-going ships; whilst the first class boats are hardly sufficiently large for independent action. What we want seems to me to be a torpedo-vessel able to keep the sea in all weathers, and a boat that is capable of being used on board ship, hoisted in and out, and will not easily get out of order. I do not think we have got that yet, but have no doubt we shall get something of the sort in time. At present we get speed out of our second class boats, but do not get much handiness. Of course, there is always the danger of screws fouling; and if we could only get the hydraulic to give us a speed of 25 or 30 knots, it would be an improved form of boat. The effect of machine-gun fire seems to me to be much overrated. I do not think either the Nordenfelt or the Hotchkiss gun would be of very great use against an attack of torpedo-boats under certain circumstances. There is a great difference between using a machine-gun in the harbour of Portsmouth, or during peace time, and against a boat advancing towards you with great rapidity in time of war. I do not think it is feasible to give these boats much protection in the way of armour. What we want to foil the attack of a torpedo-boat is to stop her. We shall not do so by perforating portions of her hull, or by killing one or two men; but if we can send a bullet into the boiler, and burst the boiler or destroy the machinery, that would stop her. If, therefore, we can protect the boiler without losing speed, it would be a very good thing indeed. As regards the electric light, I dare say many of you have seen the electric light used, perhaps have been in boats when it has been turned on you. My experience is that, under such circumstances, it is a very difficult matter to do anything, owing to the confusing effect of the light. In a case abroad, where there was a sham attack, and a small ironclad was supposed to ram, she stopped a mile away from the ship, thinking she was getting too close. Therefore, I do not think it

would be so easy to destroy an electric light by machine fire as is supposed. The remarks made by Captain Linden were very interesting indeed, and no doubt we shall get the explanation why the "Batoum" fell off so in speed. Captain Linden suggested that the trial speed should be for a certain number of hours. I should rather suggest that the trial be for a certain number of months, to see whether the vessel retained her speed for that time. That would perhaps be a more practical test.

Commander HAMMILL: There are one or two points in Mr. Donaldson's lecture I should like to refer to. One thing that struck me was the statement that for the cost of a ship, 700,000*l.* or 800,000*l.*, you might have eighty torpedo-boats, but I think it would be rather hard to work those torpedo-boats, for if you come to manoeuvre eighty first class torpedo-boats round an ironclad, there would be very good chance of their sinking each other. I think it is too often laid down that the whole of the confusion and disturbance would be suffered by the people defending the ships, whereas I think there would be quite as much confusion and irresolution and disturbance among the people in the torpedo-boats. I do not see why there should be any great difference in this respect when it is remembered that the boats would probably be under fire. One other point I should like to allude to is the distance named for effective defence. It seems to be assumed almost as a *sine quid non*, that the distance of 1,000 yards is the extreme from which you could hope to injure a torpedo-boat by a machine-gun. That does not correspond with my experience. As far as I am able to judge from seeing the guns fired, I fancy you might do damage at 1,500 or 2,000 yards in daylight with considerable ease. Mr. Donaldson quoted some run that took place last year against torpedo-boats in the "Medway." There was one experiment which he did not mention, and which I think is quite as interesting as any of them, and that was one which took place in the "Iris," a little while afterwards. She was steaming about 18 knots and with a 2 or 3 knot tide, so that she was really going 20 knots. I will only allude to one run. The target representing a second class torpedo-boat moved so that the "Iris" approached it end-on, and was on that occasion under fire about twenty-two seconds, and it is rather peculiar, the fire was to commence at a certain bearing on this torpedo-boat, and cease at another bearing. When the moment came to fire and the order was given, the gun happened to be at half-cock, accidentally, so that the first three or four volleys were lost, the cartridges being pumped through the gun without firing. I think that was enough to put the men off, but at any rate they corrected it in the time, and the boat was really under fire, including this mishap, for twenty-two seconds. As a matter of fact she was really under fire for about fourteen seconds only, but in this time she was hulled thirty-eight times, fifty-eight shots being fired. [The CHAIRMAN: Which gun was that?] The 1-inch Nordenfelt; that is a short time, the ship going at tremendous speed. On that occasion we had a first class boat out, and some attempts were made to see if the gun could be kept bearing on the boat, when the latter was going in one direction and the ship in another, of the combined speed of about 35 knots. There is not the slightest difficulty in doing so. The only thing is to see the boat, so that at night, and in thick weather, appears to me to be the time when the torpedo-boats will have their chance. But if at the same time there is a difficulty in defending a ship against boats, the difficulty increases in making the attack; they go hand-in-hand, and if the ship cannot see the boat, the boat must have some difficulty in seeing the ship. Besides, the Whitehead torpedo does not always act, it is not *quite* infallible. Sometimes you have little mishaps with it, and it does not always go straight in the direction intended. I have myself seen a torpedo recovered, after a supposed successful run, bearing unmistakable evidence of having been at the bottom. I do not wish to detract from the power of the arm, which we must all acknowledge, but it would be unjust to give torpedo-boats armed with these weapons undue influence.

Mr. DONALDSON, in reply, said: Captain Curtis has referred to cutting willows in the Thames. This was an old business of ours when we first started our works at Chiswick. At that time we built a large number of pleasure-boats, and they were mostly fitted with weed-cutters, which differed, however, somewhat from the hoop arrangement described by Captain Curtis, inasmuch as the screw propeller cut against a blade so attached to the rudder that the screw, in coming round, chopped

off any willows that got in the way. That was a successful arrangement, no doubt, for willows; but I am afraid that ropes get round a propeller in such a way that this apparatus could not cut them. I think what is required is to keep the ropes away from the propeller altogether. With regard to the effect of cutting away the lower part of the rudder, when the rudder is so cut away, and the boat is in motion, you get the water impelled against it in one particular direction, and so are able to steer better when the rudder is put across the stream; whereas, with a rudder the whole depth, you get the stream on both sides, and can steer equally well whichever way the rudder is placed. I do not think there is any improvement with the rudder cut away as far as steering power is concerned, but there is, of course, a considerable improvement in the speed. What I meant by the water running against the screw was this: that when the boat is going through the water, the water relatively to the boat is going backward. Of course, a certain amount of it next the skin is carried forward with the boat, and I said that the velocity of the water was somewhat less than the speed of the boat. With regard to the method of attaching the spar, we find it is a convenient attachment and sufficiently strong. We have run the Argentine boats at full speed, and twisted them about in all directions with the rudder, while the pole was under water; and we have also used the spar in one of the Admiralty first class boats with great success. On one occasion, while manoeuvring with one of the Argentine boats, one of the side rods gave way; that, however, was the first we had made, and was to a certain extent experimental. Of course, we got over the difficulty by strengthening the attachment. With regard to spars in falling davits, Officers who have practised much with torpedoes have come to the conclusion that the best way of using a spar torpedo is to put it into the water while advancing towards the enemy, so that there should be nothing to be thought of at the last moment but simply driving the boat ahead. If the spars have to be run out at a particular moment when the boat is within striking range of the enemy, I am afraid that sometimes the opportunity of using the torpedo may be lost. I think we are very much indebted to Captain Linden for what he has told us with regard to the "Batoum," and her behaviour on her way to and at her destination. With regard to the falling off of speed to 15 knots, I am not at all surprised that this took place. We delivered two boats in France some years ago that had maintained a speed of 18 knots on a run of two hours' duration in the open sea, outside the breakwater at Cherbourg; there was no mistake about the speed, the trial having been most carefully conducted by the French authorities, but directly our crew was taken out of the boat and the French crew put in, the speed fell off to 15 knots. After some little practice, however, they got 18 knots under the same conditions as we did; and when I was last over in France no difficulty was experienced in running the boats at 18 knots. It is largely a matter of practice, and I think some comprehensive system of practising the crews in the management of these boats should be introduced throughout the English Navy; the French crews go out many times a week regularly for practice in working the boats and their armaments, and I think their example might be followed with much advantage. With regard to the vibration that takes place in some boats at certain speeds, if you take a thin piece of wood and hold it at two points, and shake it upwards and downwards, you will find a certain amount of vibration in the unsupported parts; and these boats seem to be in exactly the same condition. In one of our boats we made an experiment, and found that at certain speeds, when the boat vibrated considerably, there was no motion whatever at two points on the deck corresponding to the parts of the thin piece of wood held in the hands. Although, as Captain Linden says, ejectors may be very useful as warming apparatus, there is an objection to them as bilge-pumps, on account of the loss of steam involved in their use. In all cases the use of the ejector involves a certain loss of steam, as the steam and water go overboard together, and if there is no spare fresh water on board to make good the loss, it is necessary to use salt water, which will probably injure the boilers. It is better, therefore, to use pumps in which any steam used in working them is returned to the condenser. With regard to boats like the "Batoum," or our first class boats, going 17 knots an hour for seven or eight hours consecutively, I am afraid it is an impossibility. The quantity of coal necessary for this speed is, of course, the great consideration, and it is impossible to carry sufficient coal

to run these boats for seven or eight hours at that high speed. I think the "Iris" goes something like 1,100 miles with all the coal she can carry at 18 knots; and we designed a boat a short time ago for a foreign Government which worked out to 65 tons displacement, and we reckoned she could only run 500 miles with all the coals she could carry. Captain McEvoy said he thought the boats ought to be armed with the various arms that I have mentioned. My idea was that it should be an alternative armament, so that the Captain of a ship, having his boat without any armament whatever lying on her deck, could put on whatever armament he thought necessary for the particular expedition he was going to undertake. He might use the machine-gun if he proposed to use the boat as a picket boat, or the spar or the Whitehead torpedo if he were about to undertake an offensive expedition.

Captain McEVoy: I think you have rather mistaken my remark. I merely said the boat should be adapted to use these weapons. I did not say that the boat should be armed with all of them at the same time.

Mr. DONALDSON: In this case Captain McEvoy agrees with me, and I am sorry I misunderstood him. I am glad to hear that Mr. Nordenfelt likes torpedo-boats. In my paper, of course, I took the worst case for the torpedo-boats, so that in actual use the chances would undoubtedly be better than those I mentioned; and with regard to any partiality for Mr. Hotchkiss as compared with Mr. Nordenfelt, I really have none; I like them both, but I do not like their guns as far as torpedo-boats are concerned. I endeavoured to be, and thought I had succeeded in being, thoroughly impartial. I mentioned the Nordenfelt bullet as going through the Herreshoff boiler, and then I mentioned the Hotchkiss gun as being fitted on the Danish boat, but I had nothing to do with its introduction there; it was done by order of the Danish Government. I think Mr. Nordenfelt's idea of using machine-guns suited for firing small bullets in large quantities on these torpedo-boats is a very good one, as we cannot hope to penetrate the plates which may be carried by the vessels, but we may distract the attention of the guns' crews. With regard to Count Hoyas' remarks as to the distance the torpedo will run straight, as he says, the guaranteed accurate range is 2,500 feet, and although 1,000 yards is slightly beyond this, it would be a very good distance at which to attack an enemy's ship, as the torpedo might be successful in hitting, and the accuracy of the machine-guns would be doubtful at that range. Of course chance plays an important part, both in the working of the guns and of the torpedoes. I quite agree with Captain Wilmot that the boats are not fully developed, and I ask naval men to tell us in what direction they think improvements may be made. I am very glad that Captain Wilmot has given us his advice on this matter. With regard to the electric light, I remember coming up the river one night in one of our boats, and, although in passing the new entrance to the Victoria Docks where the electric light is employed, we could see everything round about the entrance most distinctly, yet when we got beyond it and were looking out for craft ahead of us going in the same direction as ourselves, in which, of course, no lights were to be seen, the sterns of the boats alone being visible as we followed them up the river, it was a most difficult thing to see them. The pupil of the eye seemed to get contracted in looking at the electric light, and then looking at the river it could not expand with sufficient rapidity to enable us to see for some little time after we got past the entrance. I believe most Officers who have had experience in this matter agree that there is a great difficulty in manoeuvring where the electric light is employed. I am afraid a trial of the boats extending over a good many months, as has been suggested, would involve so much expense that it could not be carried out, and besides, as the boats would be manned by our own crew during this time, the crews of the Government who ordered the boats would lose the opportunity of practising. On the whole, therefore, I think we had better keep to our present system. With regard to the use of seventy-five torpedo-boats against one ironclad, I took an extreme case, taking capital for capital. I think that we want to have a good deal more practice with torpedo-boats, and of course if boats were largely used, and Officers were thoroughly conversant with their use, in attacking the ironclad with perhaps a smaller number of boats than seventy-five, they would be able to manoeuvre without running into each other. With regard to the range from 1,500 to 1,000 yards, I was aware of the case of the "Iris," but I understood she was running up to her target, and

the distance would be continually lessening, but I think the number of hits was given over the whole distance.

Mr. NORDENFELT : Not within 400 yards.

Mr. DONALDSON : I did not know that was so ; I did not take notice of it. Of course, with regard to the other report, I mentioned that the "Medway" came up to within 100 yards. Captain Hopkins mentions that at 1,000 or 1,500 yards the firing was not so accurate as at the shorter ranges. With regard to the question of training the machine-gun on the boats, Captain Gordon told me that he had trained one of these guns upon a torpedo-boat, going at full speed, and found no difficulty in keeping the gun on ; but I think the keeping the gun on and hitting the boat are two different things. Looking at all the circumstances I think there is still a great future for the torpedo-boats.

The CHAIRMAN : There is one point to which Mr. Donaldson has alluded which, though not precisely connected with the subject of his lecture, I should like to notice. He referred to the dazzling effect of the electric lights which have recently been placed on the new entrance to the Victoria Docks. When those lights were first placed there complaints were made of the dazzling effect, but I should like to state publicly that the evil has been cured ; the Conservators of the Thames took the matter up, and the lights are now so shaded that I trust those navigating the river will not have to complain of the dazzling effect any longer. With regard to the important subject of the lecture, it seems to me a question of some nicety as to whether the ship that is being attacked, or the torpedo-boat that is attacking, is in the most happy position. I think, as a gentleman opposite to me said, one hardly knows whether one could prefer to be in the boat or on board the ship, and I heard a rather curious anecdote yesterday with reference to this point : I was told that when a distinguished manufacturer of torpedo-boats goes down the river in this peaceful time to try his vessels at the measured mile he always puts on a cork jacket. Now I should like to ask what protection is proposed for men navigating torpedo-boats on active service ; I dare say the Admiralty have had that under consideration.

Mr. DONALDSON : We do not put on cork jackets.

The CHAIRMAN : This subject does open up a vast question as to warfare on the seas. It seems to me, day by day, in this theatre we hear of some new plans, some new schemes, and some new inventions that really seem to render the duties of naval Officers more complex each day. I think, from what we have heard to-day, from what I may venture to call the younger Officers of the Navy, it is quite manifest that at any rate their intelligence seems to keep pace with the new inventions, in order to enable them to use these complex war machines to the best advantage. I have only one other duty, and in that I am sure you will all join with me. We have heard many good lectures here, but it is very rarely that we have heard a better one than that to which we have listened this afternoon. Mr. Donaldson has evidently taken the greatest pains to bring this subject before us ; he has stated it perhaps more clearly than I have ever heard a complex subject of this kind stated in a lecture theatre : and I am sure we are greatly indebted to him for the great trouble he has taken in preparing all these diagrams, and so candidly bringing this question, in which he is naturally deeply interested, to our notice. I, therefore, beg in your name to thank Mr. Donaldson most cordially for the very able lecture he has given us.

Friday, March 18, 1881.

MAJOR-GENERAL SIR FREDERICK W. J. FITZWYGRAM, BART.,
Inspector-General of Cavalry, in the Chair.

THE STRATEGIC SERVICE OF CAVALRY (SCREENING
AND RECONNOITRING DUTIES OF THE CAVALRY
DIVISION).

By Captain C. W. BOWDLER BELL, 8th Hussars.

SPEAKING generally, the employment of cavalry in the field may be said to fall under two heads : its use as divisional cavalry and its use as the independent cavalry division.

The usages of nearly all modern armies agree in this, that to each body of troops forming an infantry division or its analogue, there must be attached a body of cavalry, generally one regiment at the outside, which shall be entirely at the disposal of the General commanding the infantry division. The duties of this divisional cavalry would be principally to assist it—(1st), during its advancing marches, by reconnoitring in advance and on its flanks whenever the country were suitable for its action, thus screening the movements of the division when it marched independently, obtaining all possible information of the enemy and the surrounding country, besides preparing the way for its division generally in matters of supply, requisitions, &c.; (2ndly), during its retreating marches it may materially facilitate the retirement, acting partly, as in the first case, in advance of the retiring division, and also forming in rear and round the flanks a *cordon* which may prevent much annoyance and needless alarm; (3rdly), during the halt of the division it would be available in the infantry outposts, chiefly for patrolling in advance and to the flanks, and for purposes of communication between the constituent parts of the division, and also between the latter and neighbouring bodies; (4thly), it would be used for patrolling and communicating purposes on escort duty; while (5thly) it would be at hand during the actual battle for employment, as a regiment, or more generally in smaller bodies, at those critical but fleeting moments when the prompt action of a few horsemen may even turn the tide of an infantry fight. In this case its action may be required against artillery or cavalry, or even to threaten infantry. In all these cases one of the most important services rendered by the divisional cavalry will be that of insuring rapid intercommunication throughout the body, and the means ofconcerting with other bodies.

My business, however, is not with the divisional cavalry, and therefore I will merely add that cases will arise when it may be neces-

sary for it to act in all respects in the same relation to the infantry division, as that which the independent cavalry division bears to the Army Corps, reconnoitring and screening far in advance.

The cavalry division may be defined as the largest tactical body in which cavalry is formed, standing more frequently in a strategic than in a tactical connection with the rest of the army. The normal composition and strength of the cavalry division of the principal Powers of Europe are, in round numbers, as follows:—

Germany.—3 brigades of 2 regiments (4 squadrons); 2 or 3 batteries. 3,600 sabres.

Austria.—2 brigades of 2 regiments (6 squadrons); 2 batteries. 2,700 to 3,800 sabres.

France.—3 brigades of 2 regiments (4 squadrons); 2 batteries. About 3,300 sabres.

Russia.—2 brigades of 2 regiments (4 squadrons, but Cossack regiments have 6 squadrons); 2 batteries. Variable.

Italy.—20 regiments (*plus* Guides), formed only in brigades of 2 regiments of 6 squadrons each, *plus* 2 pelotons of Guides. About 1,656 sabres per brigade, one to each of the 10 Corps d'Armée.

I regret being unable to add the numbers of the British cavalry division. During the last wars in which our armies made a field campaign (ending with 1815, for Sebastopol was a siege), the cavalry was divided into divisions, each consisting of two or more brigades, each brigade of two or more regiments; and according to our cavalry regulations the division would generally consist of two brigades, each brigade of three regiments. But since the present ruling principle for employing cavalry in large masses in the fight requires that it should be generally formed in three lines, we may assume that, if ever we form a division of cavalry, it will consist for the time being of three brigades of two regiments each, or should six regiments not be available, one or more of the lines will consist of a single regiment. Whether we may be able, even should we ever require, to place a cavalry division of this strength in the field (except in India), is perhaps open to doubt; but as we could employ a brigade of three regiments formed in every respect similarly to the typical cavalry division, except that each line would consist of a single regiment instead of a brigade, the following remarks may be understood as applying to the cavalry brigade which may take the place of the division; indeed, in the theoretic organization of our army a brigade of horse regiments is attached to each Army Corps.

The duties that devolve on the cavalry division are of two distinct kinds: First, it may be employed as an independent corps in the line of battle in combination with the other arms. It will then generally act on one of the wings of the line, where it will have to move in several columns, for facility in passing over the ground; these columns being so led as to enable the mass to form line or lines at the shortest notice. The tactics in lines here reach their most extended development. This mode of employing our arm is characterized by the Germans by the term "Deciding Tactics" (*Entscheidungstaktik*). The second mode of employing a cavalry division is in the form of detach-

ments, when it acts as isolated, detached, and independent bodies; this may be characterized by the term "Detached duties of Cavalry," termed by the Germans "Detachmentstaktik." Under this head are included the duties of the cavalry division in advance and on the flanks of an army, screening and reconnoitring, driving back the hostile cavalry, and piercing the veil formed by it, so as to ascertain the movements of the enemy, and from them endeavour to divine his intentions. To this must be added the employment of the independent cavalry division, or smaller bodies, on particular missions, such as enterprises against the flank and rear of the enemy, interrupting and cutting off his communications, requisitioning, &c.

As in the deciding tactics, the most important thing is to move a united mass, formed most probably in separate columns, but acting in the strictest unison, so as to be able to concentrate its effects on a particular point, so in the detachment tactics the cavalry usually moves in several distinct units. "To give it the greatest independence, a 'battery of horse artillery will generally be added to each unit (or 'brigade); while in the deciding tactics, when the cavalry division 'is employed in the actual fight, the batteries unite under the division leader, and are no longer distributed among the lines."—(Von Schmidt.)

The American Wars of 1861–65 called the attention of the military world to the importance of the strategic service of cavalry. The remarkable raids made by the cavalry of both sides were employed chiefly to threaten and destroy the communications and supplies of the enemy, and also to seize upon important strategic points. Enterprises of this sort were those of Stuart and Morgan, of Rosser against New Creek and Beverley, of Wilson before Montgomery and Macon, while the daring deeds of the prince of modern cavalry partisans, Mosby, will be preserved in the history of our arm for many an age. The cavalry of both sides was, however, rather a mounted infantry than a regular cavalry, and their action would or might have been very different had they been opposed to good cavalry proper; moreover, the close country, traversed by few roads, and those generally badly kept up, was more favourable to the incursions of mounted riflemen than to the action of regular cavalry. While, therefore, these important raids, all worthy of close study, cannot perhaps be imitated in European warfare, they proved that cavalry can, by the aid of quickly loaded firearms, assimilate the defensive element, without perhaps in the least losing its offensive value, and that it thus becomes more than ever fitted for the service of reconnaissance.

Let us pass on to the last three wars of our epoch. In the campaign of 1866, Austria, in addition to the corps cavalry distributed among the different Corps d'Armée (2 to 5 squadrons each), mobilized 5 independent divisions, 2 light and 3 reserve. Prussia formed for the 1st Army a reserve corps of 2 divisions (41 squadrons and 5 batteries), the Army of the Elbe and the 2nd Army receiving each 1 division of 24 squadrons and 2 batteries of horse artillery. During the concentration on the Elbe, the 4th Brigade of cavalry kept up communication between the 1st Army and the Army of the Elbe; it

rapidly reconnoitred all the country around Bautzen, as far as the frontier of Bohemia. On the 21st of June it rejoined its corps, after having covered 230 miles in four days. The cavalry of the 2nd Army was equally active in all the operations preceding the concentration of the columns on the Elbe; the reconnoitring bodies feeling along the three routes into Bohemia, those of Trautenau, Braunau, and Nachod, reporting that the defiles were not occupied. But while the Austrian divisions operated strategically, the Prussian reserve cavalry remained until Sadowa at the tail of the different columns, leaving the work of exploration entirely to the divisional cavalry, and the result was a marked one. Thus, on the 17th of June, it was believed at the headquarters of the 1st Prussian Army that, in addition to the 1st Light Division and the Saxon Corps, it had before it the 1st and 2nd Austrian Corps, and consequently the 1st Army advanced gropingly, and did not decide on an offensive march against Gitschin until a telegram was received from the grand headquarters. The ulterior result of keeping the reserve cavalry in rear was that the Prussians could not take immediate advantage of the victory of Königgrätz, although they had eighteen regiments intact at the end of that battle. It was only after Königgrätz that they decided to push all the reserve cavalry in advance, and then it was of some use.

Again, in the campaign of 1870-71, Germany had no more corps of cavalry, but independent divisions, two of them being attached to each of the three armies. The regiments composing them only united definitely on the theatre of operations. Even the permanent divisions, as those of the Guard and XIIth Corps (Saxon), were transported to the frontier with their Corps d'Armée. No use was made of the already formed bodies of cavalry, and divisions of recent formation were employed to cover the strategic deployment, to screen and reconnoitre the front of the armies. Nine days after the declaration of war the French had on the frontier 3 Corps d'Armée and 3 cavalry divisions. At that time the Sarre and the Palatinate were watched through an extent of 24 German miles, by only 3 regiments of cavalry and 3 brigades of infantry. A fourth regiment soon joined the cavalry, but it was only on the 31st of July that the two cavalry divisions, which were to cover the deployment of the 2nd Army, were put in motion. Although the 2nd German Army used its masses of cavalry in a methodical manner, the 1st and 3rd Army did not. As in 1866, in the march from Silesia to Bohemia, it was the divisional cavalry alone that screened the march of the different columns at the commencement of the campaign. The reason why a portion, at least, of the cavalry was not sent on in advance of the points of concentration was, probably, that the cavalry divisions were not permanently established. Before 1870, the cavalry alone was excluded from the great advantage which the Prussian Army possessed, that of unity of formation of its grand units, both in peace and war. Still, before crossing the frontier, the cavalry divisions in the centre were pushed to the front, came upon the enemy at Spicheren, Weissenberg, and Woerth, and immediately after these actions again led the way, pursuing and keeping in contact with the enemy, making requisitions and foraging

excursions to great distances, destroying magazines, rendering roads and railways impassable, cutting telegraph wires, spreading terror and insecurity everywhere. The enormous services rendered by the cavalry divisions are matters of history. Happily for Germany, the cavalry of its opponent was indifferently handled, and no attempt was made by the French to penetrate the designs of the enemy. A single energetic reconnaissance, pushed through the weak veil opposed to them, would have informed the French Commander-in-Chief of the preparatory movements, and so of the strategic plans, of the Prussians. Had the three cavalry divisions been pushed to the front, instead of being attached to the different Corps d'Armée, the opening of the campaign, at any rate, might have assumed a very different appearance.

From the last great campaign, the Russo-Turkish, but little can be learnt on the subject of the strategic use of cavalry. At the commencement, the cavalry of the left Russian wing covered the army directed on Roumania, and secured the strategic deployment along the Danube and the passage of that river; a regiment was hurried to the bridge of Barboche, which it was most important to occupy and prevent the enemy from destroying. Three divisions of cavalry covered the principal army, advancing from Sistova towards the Quadrilateral, in order to get contact with the enemy and cover the Hereditary Grand Duke's army; and Gourko's advanced guard, principally cavalry, was directed by Tirnova towards the Balkans, to cross them at a point which the Turks considered to be impracticable. After this, Gourko cut the line at Jamboli, raised the Bulgarian population, and spread consternation on all sides. On the right there was but a brigade of Cossacks in advance, and, owing to its not reconnoitring sufficiently far, the Russians were surprised by the unexpected appearance of Osman Pacha. At Plevna, the Russian and Roumanian cavalry was charged with the task of cutting off Osman's retreat, and stopping the supply of troops and material.

The Turkish Commanders were generally wrongly or not at all informed regarding the operations of the Russians, as witness the surprise of Tirnova, the passage of the Balkans, the investment of the army of Schipka, &c.

But according to General Valentine Baker, notwithstanding the immense superiority of the Russian cavalry, they failed to derive any advantage from it, and during the slow retreat of the Turks from the Balkans to the Ægean, he says that on no single occasion did the Russian cavalry ever seriously press the retreat. He adds that the Russian mounted riflemen, that is, their dragoons trained to act either on foot or on horseback, did not justify the expectations formed for them, and his conclusion is that the Russian dragoon is not a good cavalry, and is a very bad infantry, soldier. Further, he says that both Russians and Turks were absolutely deficient in scouting duties; and the rapidity and range of the infantry weapon seemed to frighten both cavalries out of all idea of vigorous action in the presence of infantry.

But while it is not necessary to dwell further upon the importance

of the duties that advanced cavalry has rendered to armies in our time, nor to enter into any demonstration of the necessity of its even more extended use in future, it will, I think, be not without advantage to study the arrangements that have been made, and some of the most important proposals that have been put forward, for regulating the employment of cavalry in advance of an army.

The strategic service of cavalry, from its very nature, has a variable character, and it would be as dangerous as impossible to reduce its mode of proceeding to anything like definite formulæ. Indeed France and Italy are the only Powers who have real official instructions on the duties of cavalry screening an army. I do not allude to our own instructions, as I take it for granted that we are all acquainted with them. But, without wishing to reduce these duties of cavalry to a formal routine, there are certain fundamental principles which will manifest themselves, and which must be conformed to, if success is to be obtained.

A cavalry division may operate strategically during the mobilization and concentration of the army, and during the actual operations; in the latter case its action must be considered with reference to three periods, before the tactical shock, during the battle, and after it.

A. Mobilization and Concentration.—To act during the mobilization, the cavalry must not only be concentrated near its zone of action, but must arrive there already completely organized and ready at once to proceed to the menaced quarter to establish contact with the enemy. It is of the highest importance that the Commander-in-Chief be put in contact with the enemy, and kept *au courant* with his movements, before he puts all his Corps d'Armée in motion. Badly informed, the commander cannot seize the initiative, must more or less depend for his movements on those of the enemy, and perhaps engage him under conditions of ground and circumstances which the enemy himself might choose. The moral effect of the opening scenes has, moreover, a considerable influence for good or evil over all the troops that must be carefully borne in mind. Thus France now has six independent divisions (or five divisions and two brigades), of which four are in the north-east, and according to the *Journal des Sciences Militaires* (February, 1880), these are not generally considered sufficient, and some would raise three more permanent divisions by reducing the divisional cavalry attached to the two infantry divisions composing a Corps d'Armée. Germany in peace time keeps up but three, of which one is in Alsace-Lorraine, but the other divisions are ready to be formed at a few days' notice, the batteries of horse artillery and staff being permanent. Russia has nineteen permanent divisions of cavalry, but the number is not fixed; Austria five; Italy ten brigades.

During the mobilization and concentration, the work of the cavalry will be offensive and defensive; offensive to reconnoitre the probable theatre of the first engagements, complete the data as to the enemy's forces, throw back his advanced troops and reconnoiters, and seize in order to utilize or destroy the most important railway junctions and lines of telegraph, &c.; the defensive, on the other hand, being required to prevent the incursions of the hostile cavalry, and secure

its own army from annoyance. Whether the offensive or defensive action is most required will depend upon circumstances, and the cavalry must act accordingly. Should there be passages of rivers or mountains to occupy, stations, tunnels, or magazines to defend, infantry might exceptionally be added to the cavalry ; but cavalry should be equal to such tasks without the help of infantry or mounted rifles.

Lewal, in his "Etudes de Guerre," states that exploring cavalry may sometimes be supported by a certain force of infantry ; but if this be done the mobility of the cavalry must suffer. On its rapidity of movement depends its utility, its very *raison d'être*. When exploring far in advance, the main business of cavalry is to see, and it must be able to do that of itself. If infantry be pushed to the front far away from the army, there could be no rapidity of movement, and it would end in the cavalry having to protect the infantry detachment. The assistance that infantry can render in reconnaissances that may have to be made when the service of outposts has replaced that of exploration, that is when the collision of the two armies is imminent, is of course quite another thing.

Von Schmidt remarks on this point that cavalry will, as in the last war, have to dismount and exchange the sabre for the carbine, "especially when hostile cavalry divisions endeavour to prevent our screening and reconnoitring operations by occupying defiles and localities with dismounted men. If in such cases the cavalry had to call upon infantry, it would suicidally degrade itself to the rank of a secondary arm, and surrender the last vestige of its independence."

The general formation of the mass of the cavalry division will be discussed further on ; for the present it is sufficient to observe that the various missions of cavalry in this branch of its strategic service require the employment of small detachments, as by these it is easier to obtain the sort of information required at this stage, such as whether such and such a locality is yet occupied by the enemy, what movements his troops are making, if the population is disposed to resist, &c. Such inquiries will refer chiefly to the junctions of main arteries of communication or railways, and consequently to large towns near the line of operations. In 1870-71 such tasks were almost exclusively fulfilled by small Officers' patrols or detachments not exceeding a squadron. The smaller these parties are, the better must they be mounted ; they will thus have a better chance of appearing unexpectedly at points, and will often have to cover long distances which would be impossible for larger bodies. As a rule, the best safeguard for parties entering populous towns far from the sphere of action of their own army, a delicate operation, and a hazardous, is the astonishment caused by their sudden appearance ; but it is advisable to disappear before the population have time to recover themselves. Thus, we saw that at Epinal, Nancy, Epernay, Troyes, Rouen, &c., it was possible for an Officer and a few men to break into a populous centre after riding 20 to 35 miles, and return safe and sound. Sometimes one or two Officers, without escort, performed similar tasks ; thus when the 2nd Cavalry Division had crossed the Moselle at Charmes on the 19th August in advance of the 3rd Army, General von Colomb's

Brigade was ordered to send a patrol to Epinal, 32 or 33 miles from the route followed by the division, in order to ascertain whether any troops were assembling there as was reported.

The account, which I take from General von Colomb's "Tagebuch," is worth noticing. He says, "I considered that the exertion of the to-and-fro journey would be too much for the men's horses, seeing that we had had only one day's rest in twelve, and that the Officer told off for the patrol would be hindered in the rapid execution of his task. As it did not appear judicious to send one Officer alone, I determined to send two; Lieutenants Wostrowsky and von Ruffer, both well mounted, were selected. They took off their helmets and cuirasses, and rode in greatcoats and caps. With some anxiety I saw them set out on their dangerous errand. Both Officers reached Epinal very quickly, rode into the place, spoke to the mayor, and satisfied themselves that the rumour of the assembly of troops was false. At night they rested a few hours in a village, remaining in the stable with their horses, and joined us at a brisk gallop at eight the next morning, when they were received with shouts of joy on all sides. They had covered more than 64 miles, and a great part of it in the night."

Whether they have an escort or not, Officers charged with such missions should avoid staying too long in the places they visit; for purposes of repose and feeding they run less danger of being surprised in woods.

While thus exploring far to the front on hostile ground, the cavalry will of course be in the best position for collecting at different points the resources of the country, either sending back such supplies as it does not itself require towards the army in rear, or concentrating them ready for the use of the army. It will, therefore, be charged with the active duties of the service of requisitions, which will be carried out according to the instructions of the Commander-in-Chief under the direction of executive Commissariat Officers; and for this purpose distinct parties of the advanced cavalry would usually be detailed, so that the more important exploring duties may not be hampered. If certain detachments are not told off for these duties, the supporting squadrons will have to perform them.

The squadrons and patrols which may be moving at considerable distances, many miles or even several days' march, cannot be rallied on their brigades every day, and this also applies to flanking patrols; but in such cases squadron commanders must be informed where the nearest troops are which could give them any required support, and they should know the direction taken by neighbouring exploring squadrons, and the missions confided to them. They must know where to send their reports, and where to establish connecting posts to facilitate their transmission. If these latter posts are themselves moving, then it should be signified where they will be found, thus: till midday at X, till 6 p.m. at Z. The last report of the day should state the proposed halting place for the night and project for the next day. Two neighbouring exploring squadrons (or patrols replacing them) should keep up communication, impart discoveries to each other, and if feasible join for the night, which will give rest to a greater

number. Marching usually on main roads, unless secrecy is of the first importance, they will keep as concentrated as possible, detaching only a small advanced guard under an Officer, and a few flankers, although it may be necessary to detach an Officer's patrol of six or eight men to considerable distances. As a rule, the patrols will rally on their squadrons at night, except those which are specially told off to keep up the touch of the enemy if he has been felt; these will bivouac. I would here remark, *en passant*, that the expression maintaining contact or keeping up the touch of the enemy, although now very familiar to all cavalry soldiers, is not always thoroughly understood; and I would lay great stress on the necessity of impressing on all ranks that merely catching sight of a few of the enemy's advanced scouts is not all that is meant by the term "contact with the enemy;" it also implies discovering, and being able to state definitely what there is immediately behind this thin veil.

Captain von Widdern remarks, that while by day the bivouac gives the best security from surprise, cantonments are better for rest at night; indeed, as Verdy du Vernois says, bivouacs do more harm to cavalry than the enemy's bullets. Von Widdern points out that with negligent outposts a surprise is as possible in the one case as in the other. If the population are on friendly terms with the troops in cantonments, the latter will do better to defend their positions, in case of night attack, than to scatter in the open; but the war of 1870-71 furnished frequent illustration of the principle that in a hostile country cavalry at night should not occupy a locality which is out of proportion to its strength, and cannot be properly watched or barricaded. If small bodies of the enemy approach within 1,500 paces of a night bivouac, they can, by a rapid fire, throw cavalry into the greatest disorder, and force them to disappear; while in cantonments there would be less fear of the result of such alarms.

Contact with the enemy once established, the cavalry division need not hesitate to hang back a little, so as to put the main body under shelter and protect it from the too immediate action of the enemy. The small bodies in advance remain out or take up favourable sites, while the main body, even if some time be lost, should generally be moved to localities near the main route; their better night's rest will make both men and horses fresher for the morrow's work than if they had bivouacked. In cantonments it is safer to give the troops depth of formation rather than excessive breadth of front. Of course the main body, when in face of a superior or enterprising enemy, will bivouac where it halts, especially if they have already crossed swords and expect a combat requiring all their strength the next day.

The entry into cantonments by a body of cavalry must be made with every precaution; thus, a squadron about to occupy a village assigned to it will be preceded by an advanced guard, which, after turning and traversing the place, and reconnoitring in its vicinity, will halt in a favourable position, as a temporary outpost, until the squadron has established itself in the village. Small detachments should prefer secluded farms to larger places near the main routes; they should not occupy them till just before night, taking care to

search them previously, and should make the proprietors or village authorities responsible for their safety and take hostages for this end. Men and horses should, for choice, be put up in large stables or barns, and by preference, such as admit of sudden and easy escape. Sentries and patrols will be established, according to strength, and an alarm post decided on. If the place entered by reconnoitring bodies is not to be occupied permanently, the post and telegraph offices should be ransacked, all possible information obtained from the local authorities, stores of provisions destroyed or placed in security, and everything done to hinder the mobilization of the enemy; thus, by making requisitions for large quantities of supplies, which may perhaps not be immediately wanted, not only may the enemy be much inconvenienced, but he will probably be deceived as to the movements of the large masses of our force. Sometimes a requisition, or receipt, or even the envelope of a letter addressed to a military commander and found lying on a desk in the mayor's office, has given a clue to the passage of certain corps on certain days. All such scraps of information will be sent to the headquarters of the division and there examined and collated before being forwarded with a brief comment to general headquarters. Squadrons and patrols should avoid passing through villages and defiles that they have already traversed, should never halt twice at the same place, and should change their bivouac or cantonment every night. The inhabitants left must be deceived as to the mission and direction about to be taken, and no traces of one's presence should be left, except that papers might purposely be forgotten which could mislead the finders. If prisoners are ordered to be made, and they are at this stage most useful, not merely on account of the information they may give, but also as indicating the corps opposed to us, every man of the party should bear the necessity in mind; when taken they should be questioned forthwith and separately, as after the first surprise and fright are over, their answers will be more guarded and evasive. Detachments sent on special missions, which may be pushed on to a distance of several days' march, should return to the division the moment their task is accomplished, not only because a feeling of insecurity is established by their sudden appearance and disappearance, but because, as von Schmidt points out, there is always a tendency to forget the object for which they were detached and to strike out some line of their own; thus weakening the main body and perhaps bringing about results which are not convenient. Detachments merely searching for, or keeping up the touch of, the enemy, can, of course, have no distance assigned to them.

Cavalry Officers will, perhaps, seldom be called on to reconnoitre country, which is more usually the work of the Staff, but they may have to report on the roads, bridges, and fords, and would always do so if they found any deviation whatever from the maps; as, e.g., if a road shown as an insignificant track on paper has since been made a good high road.

As to the provisions of small detachments, one day's food will be carried on the saddle, but this should only be used when the mission is not likely to extend over twenty-four hours; but in any case, if

possible, food should be obtained by requisition, and the ration carried should be preserved intact. For the provisioning of the cavalry division, which has all the first resources of the country at its disposal, I must refer to Verdy du Vernois.

While thus pushing far to the front the divisional commander will of course keep up constant communication with the commander of the advanced guard of the Corps d' Armée in rear, but time and space do not admit of my entering into the mechanism of this communication.

In case of the defensive, any infantry attached to the cavalry, or in its absence a portion of the cavalry dismounted, would undertake the defensive at the frontier, confining itself chiefly to obligatory points, localities on the frontier which are most likely to be forced by the enemy, while the cavalry patrols will explore to the last moment. If, however, there be sufficient cavalry on the frontier, it will be preferable to occupy the enemy in front, and send larger bodies of cavalry round to his flanks and rear; their object will then be simply to explore, they will have nothing to do with the defence, no care for their line of retreat nor for their connection with the heads of columns, and thus can act with the greatest independence and enterprise.

We now come to the action of the cavalry division.

B. During the Operations.—First, let us consider the composition of the independent cavalry divisions.

Their strength will depend on the resources of the army and the mission they are to fulfil. All the armies of our day covering themselves with a screen, there will certainly be combats between the opposing cavalry; each then must be strong enough to resist the other and prevent his seeing what passes behind the veil. Again, when the opposing forces approach to fight, the independent divisions which have reconnoitred the strategic front will fall back on one or both flanks, whence to threaten the enemy's flanks and oppose any turning movement of his cavalry; again there will be cavalry fights, and the division must be equal to this. On the other hand, they must not be beyond the control of the chief, who must be able to take in the whole extent of his troops in order to use his reserve effectively. In order to fulfil these opposite conditions, Verdy du Vernois estimates that cavalry divisions should consist of from four to six regiments of 600 sabres each; with less than four, after making necessary detachments, the divisions would be too weak for the exigencies of grand engagements; and to direct the fight of more than six regiments, a chief of exceptional qualities would be required, and the troops must be perfectly trained.

You will observe that I take it for granted that entire cavalry divisions are to be employed in the duties under discussion, but there are many opponents of this formation. Thus General Lewal advocates that divisional cavalry only should be organized. The chief objections to the employment of independent divisions are, 1st, that the division is too large to employ as a mass; 2nd, that it is difficult to subsist; 3rd, that it is too extensive to direct on the service of exploration.

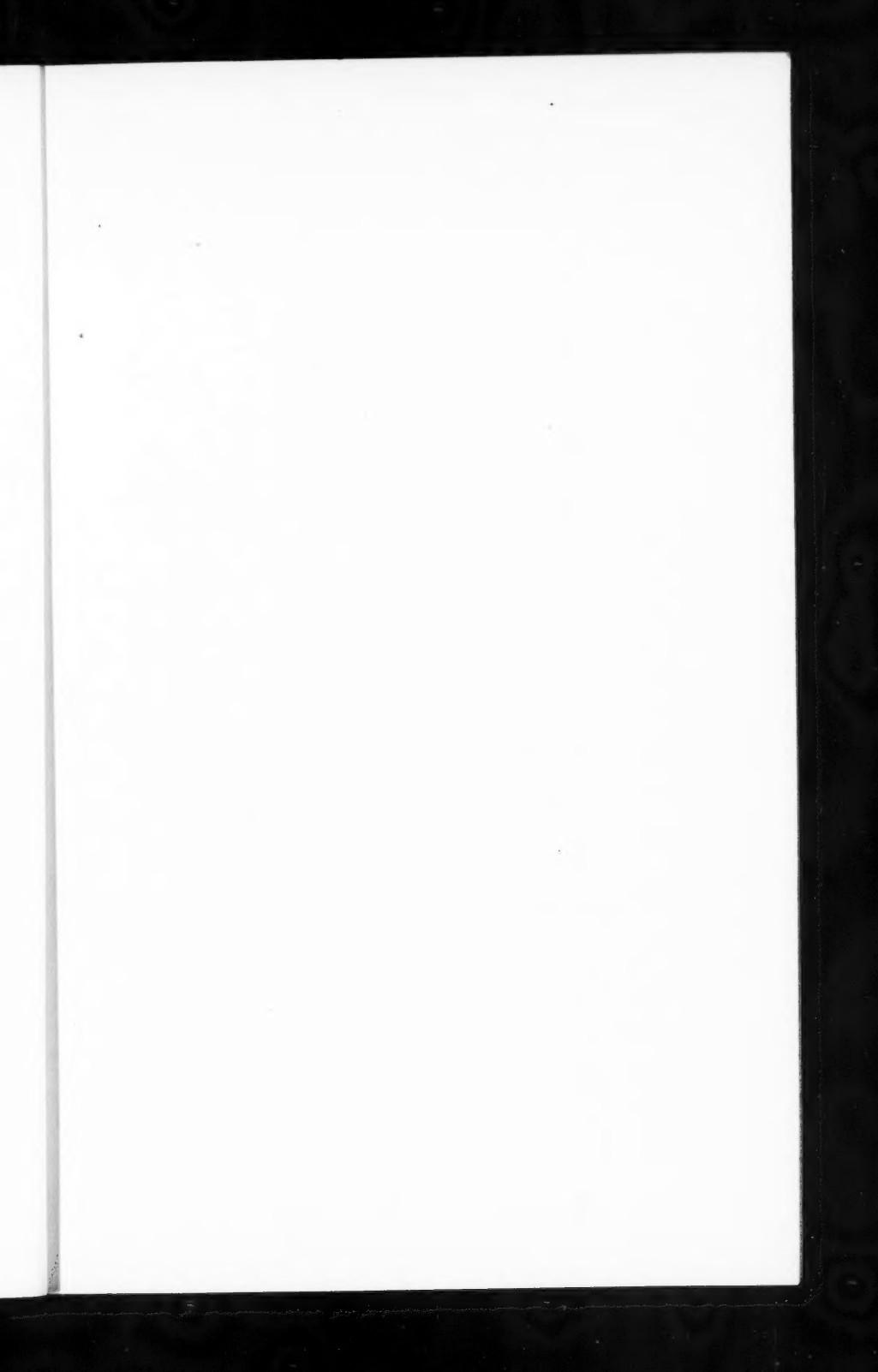
Replies to these objections are perhaps not difficult to find, but time permits me merely to notice that as compared with the proposed system of having only divisional cavalry, the employment of an independent division under one head, and that head in immediate communication with the Commander-in-Chief, would be more likely to ensure thorough and systematic exploration in all directions and greater unanimity of action than could be hoped for if the exploring cavalry were composed of fractions under the immediate orders of the commanders of army divisions; the latter would naturally use their cavalry in accordance with the wants and movements of their own divisions. Again, to force the enemy's veil, masses of cavalry will probably be required, and if judiciously distributed on a proper extent of front, the advanced cavalry ought to have no difficulty in arranging to obtain its supplies from the country marched through. In Germany and France the divisions contain 3 brigades; generally 1 heavy and 2 light, each brigade of 2 regiments (8 squadrons). In Austria and Russia, divisions are of 2 brigades, each containing, in Austria 12 squadrons, and in Russia 8 or 10 squadrons. Italy has no regulation formation for the division, but only brigades of 2 or 3 regiments (12 or 18 squadrons) *plus* 4 or 6 pelotons of Guides, *i.e.*, 2 pelotons to each brigade. In discussing the question, which is the most advantageous formation, we must bear in mind that the mission of the division is double; to see what the enemy is doing, and to prevent his seeing what we are doing. To the first end the division must extend on the widest front; for the second purpose it must be able to concentrate and fight. Now when extended to form the screen it is generally formed in three lines, the 1st containing the bodies furnishing the actual reconnoitring parties; the 2nd, the supports of these; the 3rd, the reserve, kept in hand by the division leader to meet eventualities. It will probably be granted that the 1st and 2nd lines shall belong to one unit, so that if the former is driven back the mutual support may be more assured; and that the reserve would work better if composed of one constituted whole entirely at the Commander's disposition. If, then, the division consists of three brigades, it seems wise to employ one brigade as reserve, and to place one regiment of each of the other brigades in 2nd line and the other regiment in advance of it in 1st line. Thus, in case of falling back, the patrols and advanced scouts will fall back on their own squadron, the squadrons on their regimental headquarters, when the advanced regiment will fall back on the 2nd regiment of the same brigade. The reserve will have sufficient strength to intervene with effect at critical moments, and owing to its independence of other lines will have no tendency to enter into action before the favourable moment has arrived. If, however, the division consist of 2 brigades of 3 regiments each, either the reserve will be formed by 2 regiments, 1 from each brigade, when it would want homogeneity and probably not be well in hand; or worse still, by taking 2 regiments from one brigade for the reserve, we should have one of the advanced regiments supported by a regiment of another brigade. Thus the formation in 3 brigades seems the best for reconnoitring purposes and is

even more necessary for combat, where (in brief) the 1st line is (as von Schmidt puts it) the striking line, the 2nd on the exposed flank the manœuvring line, the 3rd the reserve (*bereistreffen*).

To these considerations von Verdy du Vernois adds that two regiments represent the maximum that can receive the direct impulsion of one chief. He insists, too, on the necessity of these divisions being formed in time of peace, and not improvised on the outbreak of war; for they are the first great units launched against the enemy, and owing to the rapid changes of events in the conflicts between the cavalry divisions, the utmost harmony and mutual understanding is required. Cavalry divisions having to cover the army to considerable distances and being thus deprived of the support of the other arms, it is necessary to attach artillery to it, both to clear the way for it during an advance, and to assist it in keeping back the heads of pursuing columns, when it is covering a retreat. Generally two batteries of horse artillery are attached to the division, and it appears to be the present opinion that it would be better to exceed than to fall short of this number; bearing in mind always that this artillery is added during the reconnaissance not to assist the division in *fighting*, but to help it to *see*, which latter it must do by stealth or by force. Time prevents my entering into this question, as also into those of the ammunition columns, sanitary detachments, rations and forage convoy, and carried detachment of engineers required for the independent movements of the division.

The front and depth of the division must depend on the dimensions of the zone to be explored and the proximity of the enemy. During the campaign of 1870-71, the greatest extension of the 5th and 6th German Cavalry Divisions preceding the IIInd Army did not exceed $42\frac{1}{2}$ miles, say 21 miles per division. The French Instructions of 1876, for cavalry reconnoitring in front of an army, lay down that the zone ought not to exceed a maximum of 19 to 22 miles; but the present opinion of most competent authorities in France and Germany is that $9\frac{1}{2}$ to $12\frac{1}{2}$ miles is the maximum. The German cavalry division could extend on a front of 21 miles in 1870, because there was nothing to oppose it. As to depth, it is assumed that the distance from the independent divisions to the head of the following infantry columns should not exceed $15\frac{2}{3}$ to 19 miles. Before the concentration, the cavalry may be pushed to great distances in advance, but this critical situation will be but momentary; soon the armies will advance, and then the divisions may no longer be at 125 or even 50 miles from the Corps d'Armée, but 15 or 19 miles, at the outside, from the divisional cavalry. Contact made and the enemy reconnoitred, these distances diminish every day to $6\frac{1}{4}$ or 5 miles, and disappear altogether when the tactical operations begin.

The division may possibly have to march chiefly on one road, or two, or on three parallel routes. In the first case, a light brigade with one battery will form the advanced guard; in the second, a light brigade will form the advanced guard in front of the heavy brigade on the main road, while the other light brigade will take the less important parallel route; in the third case, the brigades will advance abreast,



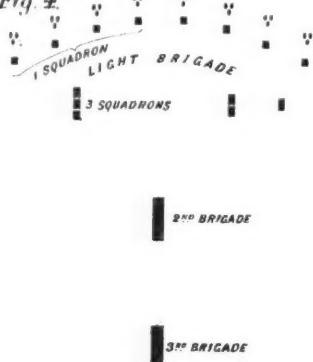
IVth GERMAN CAVALRY DIVISION.

Fig. 1.



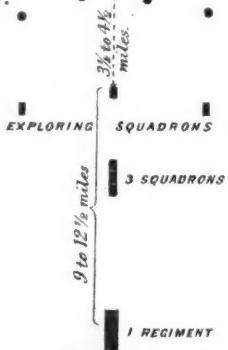
FRENCH MANOEUVRES 1879.

Fig. 4.



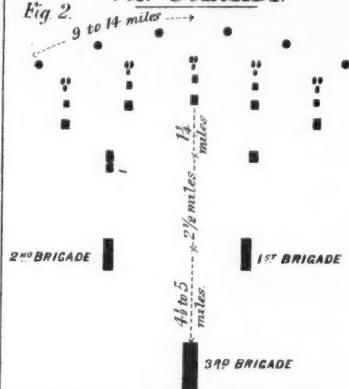
ITALIAN REGULATIONS.

Fig. 5.



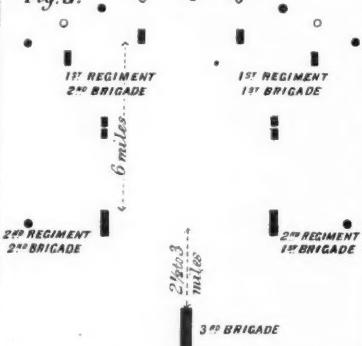
VON SCHMIDT.

Fig. 2.



FRENCH INSTRUCTIONS 1876.

Fig. 3.



COL^E BONIE.

Fig. 6.

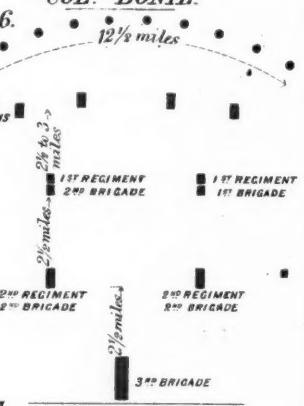
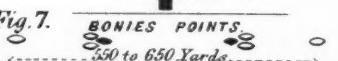


Fig. 7.



each with its own advanced guard. The last disposition is the most favourable for marching, cantonments, and supplies, and admits of a wider front being explored ; as long, therefore, as an encounter is not imminent, it is to be preferred, even if the columns be separated by a short day's march ; but once the enemy felt, the division will narrow its front so as to be able to concentrate in a few hours, either on one of the flank brigades or the centre, which may advantageously be kept back some 3 miles or so, so as in a manner to form a reserve. In practicable ground a division is sufficiently concentrated if the main bodies of the two extreme flank columns are $6\frac{1}{4}$ miles apart, and the reserve brigade 3 miles or so in rear.—(Von Widdern.)

It will be worth while to notice here the actual arrangements, made merely for purposes of reconnaissance, during the advance of the 4th German Cavalry Division during one period of the 1870-71 campaign, which I extract from the "Record of the IIInd Life Hussar Regiment," by Lieutenant Mackensen (Berlin, 1877), a most valuable work. At the period alluded to, the division advanced chiefly in one column. (See Fig. 1.) In the main direction a strong Officer's patrol preceded the advanced guard about a day's march ; about half a day's march in rear of this and a day's march to the flank of the main route moved two half squadrons as flank coverers ; these were furnished by the advanced guard brigade, which kept two squadrons in advance as vanguard. Generally there was no battery with the advanced guard. At about one mile or more followed the main body, the Uhlan brigade in front, then the batteries, and lastly the heavy brigade. The Uhlan brigade provided a squadron at half a day's march from each flank of the advanced guard as flank coverers. The patrols of the latter and of the numerous zugs detached as requisitioning bodies completed the screen round the head of the main body. Did time permit, it would be most interesting to follow out in detail on the map the arrangements and movements of a division during an actual or supposed operation. For examples of this sort I would refer, first and foremost, to the second part of von Verdy du Vernois' "Studies in Troop Leading," which has been translated into French, and of which there is an able and instructive review by Lieutenant-Colonel F. C. Trench in No. XCIII of the Journal of this Institution. It is much to be regretted that we have no English translation of the work, as it is undoubtedly the most complete, as well as the most interesting, exposition of the entire duties of the cavalry division.

Von Schmidt's views of the typical formation are briefly as follows :—

Two brigades in advance, each having one regiment in first line and one in second line, in compact order, following its own advanced regiment at about $2\frac{1}{3}$ miles (see Fig. 2) ; each advanced regiment would scour a front of 9 to 14 miles by keeping two or three advanced squadrons (according to ground and other circumstances) in first line and following with the rest in compact order in rear of the centre ; the advanced squadrons form their own advanced guard ; the third brigade follows in rear of the centre, at about $4\frac{1}{2}$ or 5 miles ; and a battery of horse artillery is usually attached to each brigade. The division will usually be two or three days' march from its Corps d'Armée, the distance

depending on the nearness of the two armies. The searching of the ground in all directions in front will be done by Officers' patrols extending to considerable distances, and small patrols on bye roads and to short distances. When the enemy has been felt he must be held on to, unless distinct orders to the contrary be given, but all superfluous parties must now be drawn in, the points of advanced guards keeping up the touch, while Officers' and other patrols hang on to the enemy's flanks where they can best observe.

Up to this point, that is, while still seeking the enemy, or as long as only his small detachments have been encountered, or the enemy yields before our approach, the whole of the exploration is done by small bodies, from an Officer's patrol to a squadron, which move beyond the advanced guard or guards, or patrol on the flanks of the main body of the division; they must be absolutely independent of the main body, and act in precisely the same manner as the detachments employed during the mobilization and concentration of the troops. The extent to be explored and amount of resistance expected will decide whether it will suffice to put one brigade in first line, or whether a second or even in exceptional circumstances the third, is to be pushed forward. The main body of the division will be so placed as to be able to make its action felt where there is most chance of meeting the enemy in greatest force. We now advance a step, presuming that the hostile armies are approaching each other, and that the enemy's cavalry begins to make himself felt with more or less obstinacy.

1. *Strategic service before the tactical shock.*—Here the two chief ends in view are: 1st, to procure for the Commander-in-Chief exact and continual information as to the movements and force of the enemy, so that he may concentrate at the right point; 2nd, to prevent similar attempts on the part of the enemy.

It should be noticed here that very conflicting views are held as to the most suitable typical formation for the cavalry division in this stage, and it will be my aim presently to compare them as clearly and concisely as may be, so as to assist us in drawing our own conclusions.

It may be taken as admitting of no dispute, that the Officers who now command the most advanced bodies must be among the best linguists, the most skilful and best mounted in the division; they, and in most cases each man of the party under their command, should clearly know what particular point they ought to endeavour to ascertain; and, in order to do this intelligently, the Officers must have a thorough knowledge of the present strategic situation and the operations proposed. They will, perhaps, more generally gain their information better by working on the flanks than by endeavouring to pierce the front of the enemy's screen; but no rule can be laid down on this point. Their main object is to obtain information of a positive kind, avoiding all combat that is not absolutely necessary in order to gain this end.

Too many missions should not be confided to one Officer's patrol, nor too large a zone of exploration; the prompt and safe transmission of information will generally be better secured by sending out as many detachments as there are important reports to be received, and

means must be established for sending in reports rapidly and surely. Reports from the front should, if possible, be sent direct to the divisional commander; but men bringing in a report should always communicate it to the commanders of any bodies of their own troops which they may meet on the road, who should notify on the report that they have seen it.

At the commencement of the operations, the divisional commander receives all his information from the Commander-in-Chief, and transmits all information obtained direct to him, communicating it to the nearest Corps d'Armée commander when he thinks it necessary. But when the front of operations of the different armies has extended, and each is pursuing particular ends, all instructions for the cavalry commander, as also his report, should be sent through the Corps d'Armée commanders. The directions requisite for the cavalry commander comprise:—

1. The present state of operations; he cannot sufficiently know the general situation, but it is absolutely necessary that he should.
2. All that is known up to date of the force, composition, position, and movements of the enemy; including, if possible, an *ordre de bataille* of the hostile army.
3. A sketch of the probable operations of the enemy; for the cavalry commander has not at his disposal the various materials which general headquarters have for forming an opinion on the subject.
4. The special task of the division.
5. Where reports are to be sent, and how.
6. Up to what point he can reckon on the support of other troops.
7. What lines of communication and telegraphs are to be occupied or destroyed.

Most of these points (except 1 and 3) could with advantage be communicated to all the Officers of the division; for each Officer ought to be able to act independently, and should, therefore, be able to understand and judge correctly of the importance and bearing of any events that may occur.

As to the special mission of the division, the main routes on which the enemy's forces could operate must, above all, be watched, while the whole extent of front must be scouted, lateral lines of communication must be explored, and even occupied, if necessary; and withal, the main body of the division must be held as concentrated as possible on or very near the principal route. Here, then, lies the whole art of command; the extent of ground to be reconnoitred and the operations of the enemy require that numerous detachments be made, but the final end of the strategic service, success in the actual fight, can only be obtained by sufficient concentration. The maxim applies as forcibly here as in outpost service—"He who tries to cover everything covers 'nothing.'

It would be very interesting, and probably instructive, to know on what principle the advanced cavalry was formed in Napoleon's time, especially before it was ruined by the campaign in Russia; but unfortunately nothing precise can be gathered from the records of that period. We know that cavalry did explore to a distance of several

days' march in advance of the armies, but nothing like a system can be discerned.

As Colonel Bonie remarks, this may be owing to the permanent state of war which existed then, and to the fact that all the cavalry Officers were formed in the best school, that of experience, and that theories were to them but of secondary importance. Now-a-days campaigns are too rapid to allow time for gaining experience, and general principles at any rate must be settled before the war begins. But even did we know how the advanced cavalry was formed in olden times, the mode of proceeding then in vogue must have been very different from that which is required in view of the rapidity of transport and concentration now allowed by railways, the vastly increased number of available roads which now intersect all European countries, and the increased ranges of modern firearms, which require that the main body should be screened to a much greater distance in advance.

Much, too, might be learnt from the mode of proceeding of the cavalry of the Army of Silesia in 1813-14, when, I may remark *en passant*, chains of vedettes were not in vogue on outpost service, but were superseded by the patrols which most armies are again reverting to. We know that in 1813-14 Katzler, the celebrated advanced guard leader of York's Prussian Corps, usually kept two squadrons of hussars in contact with the enemy; they were perfectly free in their movements, and had no connection with the advanced guard or main body of the cavalry, beyond having to send in information in good time and plenty of it. The biography of this General is well worth studying.

Let us see what instructions are in force in France and Italy.

According to the last French instructions (27th June, 1876), one brigade forms a general reserve on the main route about $2\frac{1}{2}$ or 3 miles behind the second line (see Fig. 3); this latter consists of one regiment of each of the other two brigades, supporting, at about $6\frac{1}{4}$ miles' distance, the other regiment of each advanced brigade; these advanced regiments form the first line, and march with two squadrons in first line at intervals, according to the front to be covered and routes that the enemy is likely to take, but not exceeding $3\frac{3}{4}$ miles. The intervals in any case to be such that the squadrons may be in good communication with each other, and that no party of the enemy may be able to penetrate the zone of exploration without being at once detected. The other two squadrons of the advanced regiment follow, under the Colonel, half-way between the advanced squadrons and second line, in rear of the centre of the former or in rear of the most exposed flank. The regiments in second line march on one of the routes at their disposal, either in rear of the centre of the advanced regiment of their own brigade, or in rear of that flank of it which appears most exposed to attack. But while the first line is considered the reconnoitring line, the second is also made to furnish flanking patrols to considerable distances, and Officers' patrols, which spread *far to the front*, but should not go over the routes traversed by the squadrons of the first line. The connecting posts need not be described. The advanced regiments are relieved every other day by the second line. Thus two-thirds of

the division are out of the divisional commander's hands, and more than one-third are performing the harassing duties of first line. Walter and von Widdern find fault with the scheme as being too formal and not taking into account the measures taken by the enemy. The French themselves appear not to approve of it; thus in an able article in the February number of the *Journal des Sciences Militaires* of 1879, it is objected that the squadrons are too much dispersed, and the échelons in the second line too feeble and distant to oppose sufficient resistance to an energetic attack; the fractions would be rolled up successively and the whole veil torn to shreds. According to the reports on the manœuvres of 1879, the theoretic disposition now affected would be somewhat as follows:—In first line a light brigade for exploring purposes, each regiment detaching only one squadron in advance for reconnaissance, while the three other squadrons march, under command of the Colonel, in rear of the centre or of one of the wings of the advanced squadron (see Fig. 4). These squadrons may move on one or on several roads, provided they are not more than a mile apart, so that their assembly may be prompt and easy. Each of the advanced squadrons breaks up into four pelotons, each peloton preceded at from 850 to 1,300 yards by a point, under an Officer or non-commissioned officer. The remaining two brigades of the division follow on a central or separate route.

According to the Italian instructions, the corps selected for this purpose move out in columns until within $9\frac{1}{2}$ or $12\frac{1}{2}$ miles of the place where they expect to meet the enemy (see Fig. 5); a part, generally half, then deploys into as many exploring columns as there are principal lines on the ground to be reconnoitred, these columns break up into smaller fractions of patrols or groups of scouts, which are pushed $3\frac{2}{3}$ or $4\frac{1}{2}$ miles in advance. Thus, as Colonel Walter remarks, the Italian cavalry, whether circumstances require it or not, divides itself into four lines. If a brigade of two regiments is to reconnoitre, it keeps one regiment (six squadrons) in reserve; the other pushes on, keeping three or four squadrons in support while two or three are sent in advance as exploring columns. Here again is the idea of forming a complete and permanent net, which the enemy shall be unable to penetrate at any point. An interesting feature in the last Italian manœuvres was the addition of three battalions of Bersaglieri to the two brigades in the valley of the Po, said to be a practical application of the ideas of Boguslawski.

At the risk of being tedious, I would now ask you to examine a system of reconnaissance elaborated by Colonel Bonie, commanding 11th French Hussars, published in the *Journal des Sciences Militaires* of December, 1878, which I think deserves especial consideration. Starting with the hypothesis that the duties of the advanced cavalry are, (1st) to explore, for which numerous small bodies are required and best fitted; and (2nd) to resist the enemy's attempt to do the same, for which concentration of force is necessary; his experiments, now carried on for many years, have been conducted with the object of resolving the problem how to get the maximum of concentration and resisting power with the greatest necessary amount

of breaking up into small fractions. As Colonel Bonie truly remarks, most people sacrifice a great deal to exploration, and more or less neglect that rapid concentration for combat, without which the rôle of cavalry is utterly unnatural. He considers that many lines do not ensure a screen, a pompous word (as he terms it) which, under a seductive figure, hides only a pure delusion. In brief, his plan is this:—In 1st line he has only points, whose sole object is to explore. These consist of four or six men and a corporal under an Officer (or non-commissioned officer), all selected as being among the most intelligent and well mounted (see Fig. 7). The formation they will usually take on the march is shown in the figure, but this, of course, will be left to the discretion of the point commander. The composition of the point admits of its being divided into two groups. The normal longitudinal formation is a great safeguard against falling into ambush or being cut off, as one man will be pretty sure to escape. These points moving in extended order, the men will be much more on the alert, and will see more than if they were grouped together. The whole strength of these parties lies in their smallness, as they are unseizable, and in their mode of proceeding they may be compared to flies which one keeps constantly trying to drive away, but without effect, as they again and again return with an enervating persistence. Colonel Bonie assigns no limit to the distance to which these points should move, but while seeking contact and moving in a friendly country they cannot push on too far, provided that they feel their horses are still capable of moving a few miles to the rear in case of having to retreat.

In view of the ultimate object of all cavalry action, the combat, he arrives at the conclusion that in order to be sufficiently concentrated for fighting, the four squadrons of a regiment should not attempt to cover more than, at the outside, $6\frac{1}{4}$ miles; and he considers that five points should be amply sufficient for this extent of front, each observing 1,100 yards to right and left (see Fig. 6). When in the enemy's country the points ought not to be so far in advance, for they will run the risk of being cut off; but they must be near enough to the next line to receive support, say $2\frac{1}{2}$ to $3\frac{1}{8}$ miles. The 2nd line has for object to fight, and must be so disposed as to assist the points in front. While marching towards the enemy in order to get contact with him, the advanced regiment should detach two squadrons (termed by Bonie "Contact Squadrons"), which will march at $2\frac{1}{2}$ to 3 miles in rear of the points; their object will be to support the points if they meet with any resistance which they cannot overcome, also to seize important places indicated by the divisional commander, destroy railroads, telegraphs, bridges, &c. In rear of the contact squadrons the rest of the regiment follows under the Colonel with its advanced and rear guards. The contact squadrons exist only during the march and while the enemy is not yet signalled in force, but as soon as real contact is established the points alone cling to the enemy and the troops in rear must concentrate. Colonel Bonie fully anticipates the objection that if but such a small extent of front be covered by each division, more cavalry would be required than is generally available.

He grants that more cavalry would certainly be necessary, but repeats the idea enunciated by him in his history of the French cavalry during the late campaign, that the brigade of cavalry could not be allowed to the Corps d'Armée during the service of exploration, and that it will be sufficient to give them one or two squadrons. In a criticism of this work, General Borbstaedt replied that the idea might be true for France, but that the Germans, with their excess of cavalry, could still maintain that organization. As one occasionally hears the opinion expressed in England that hereafter such large masses of cavalry will not be used at the commencement of hostilities, the following extract from a recent German official report will not be without interest:—"At the commencement of hostilities the whole of "the cavalry at the disposal of a country ought to be thrown in "advance of the armies. We, therefore, do not hesitate to borrow "from the divisional cavalry the troops necessary to raise the desired "strength of the independent divisions to six regiments each. The "divisional regiments in taking part in the general work of exploration as members of the independent divisions will cover their "infantry in a much more practical manner than they would do if "isolated; they would, moreover, be merely temporarily detached and "could later on join the corps to which they belong."

As a general conclusion from the various schemes alluded to, it appears, then, impossible to lay down absolutely whether the division should be kept together on one line of march, or distributed on two or three parallel routes; whether it should advance by all the routes leading towards the enemy, or should merely detach fractions along the most important avenues; whether the detachments in advance should have special reserves or there should be only one special reserve. These points must depend on the extent and configuration of the zone to be explored, the complexity of the network of communications, the presence and activity of the enemy, and the information about him received from time to time. Only when the divisional commander is kept thoroughly acquainted with the situation and operations of the hostile cavalry can he act according to the exigencies of the moment.

The latest writers on this subject (as von Widdern) seem to hold the following views, which, in many respects, differ widely from Colonel Bonic's.

Patrols without supports cannot be sure of procuring information, for they must avoid every detachment of the enemy stronger than themselves; they must, therefore, have their special supports, but if repulsed they must not retire but move to the right or left, or wherever they can best penetrate the enemy's screen and see what there is behind it. No distances can be laid down for the advanced patrols; they have to find the enemy and, when found, to stick to him; they and their supports must be independent of the main body, but constantly in communication with it. The sector to be explored by these squadrons may be $3\frac{1}{2}$ miles or more, but will often be limited to $1\frac{1}{4}$ or 2 miles. Only the number of patrols absolutely necessary will be detached; those destined to reconnoitre the principal routes will be

commanded by Officers, and sufficiently strong to overcome the resistance which the enemy's most advanced patrols are likely to offer without having to call for support; while those that have only to overrun the secondary roads will be under intelligent non-commissioned officers, and so weak as to be able to glide about without being seen. But this, according to recent writers, is not sufficient. Special reserves are said to be required, serving as a support to the exploring squadrons and their patrols, and as a bond of union between them and the main body. They are to follow the squadrons and as much as possible in rear of their centre. These special reserves must provide for their own security by advanced and rear-guards and flankers, as the exploring squadrons may be cut off. The point of the special reserves should preserve contact with the preceding squadrons, and communication must be preserved with the flank-covering bodies. These latter are strong bodies, squadrons usually, which keep up constant communication with the main body or its advanced guard, on the flanks of which they move by parallel routes at considerable distances. To prevent the march being checked by mistaken appearances, it will always be well for the advanced guard to have some patrols well in advance of its advanced party, even though the independent advanced squadrons are still further in advance.

It will, of course, be better if the supporting squadrons are kept informed among themselves of everything important that occurs to neighbouring squadrons and their patrols, but this should not be allowed to interfere with the work of exploration. As soon as the exploring squadrons meet large bodies of the enemy, their march is arrested and perhaps a retrograde or lateral movement necessitated; the situation of the moment, the nature of the ground, and other circumstances will indicate the most advantageous direction for the retreat. If there are special reserves they will be informed at once of the decision and measures taken, and the squadrons, if compelled to retire, will do so as slowly as can be, if possible towards a flank of the special reserve. If there be no special reserves, squadrons should, whenever possible, close to one of the neighbouring squadrons, which must be rapidly warned; but in any case an Officer's patrol should continue to explore in front if it can be done. The squadrons on the flanks of the division have an important rôle to play. They can often work round the enemy's flanks and there make full observations, or they may have to prevent similar attempts made by the enemy. They must, therefore, have great independence of action; they must be kept informed of the probable and actual movement of the main body of the division, and must similarly notify their position and proposed operations for the next day. The divisional leader must be continually informed on what lines of march, or in what zone, the exploring squadrons and other independent fractions are moving; and all subdivisions, when compelled to quit the zone assigned to them, must at once report the fact to the divisional commander, and similarly when they reach any important points. If no information should be received from any fraction for a considerable time, a detachment will always be sent in quest of it.

I would here allude to a circumstance which appears to me to require serious consideration: I mean the very liberal use, or abuse, that we are recommended to make of small parties commanded by Officers. To read a French or even German work on the subject of this paper, one would imagine that Officers' points or Officers' patrols were among the most abundant productions of nature. On this head a criticism of General de Gallifet, having reference to the French manœuvres of 1879, is worth noticing. He remarks that very few Officers (of course he alludes chiefly to French Officers) are fit for these duties, which require uncommon vigour, physical and moral, an exceptional *coup d'œil*, a thorough knowledge of ground and of map reading, excessive boldness, tempered, at the right moment, by the greatest prudence, and, lastly, a first-rate mount. "How many troop 'Officers,'" he asks, "unite in themselves all these conditions?" Indeed, he considers a regiment well off which possesses four such leaders, one per squadron. When one remembers that these Officers may be absent for two or three days, that they are sometimes killed, and often taken prisoners, we see with what reserve such precious means of investigation should be made use of.

When detachments move on important lines, or have to obtain information of great value, a Staff Officer, accompanied by an escort, will frequently be attached to them. This was often done in the German Army in 1870-71; thus, on the 16th of August, the Chief of the Staff of the Xth Corps d'Armée accompanied the 5th Cavalry Division in its reconnaissance of Thionville, and, on the same day, the Staff Officer of the 6th Division accompanied the leading squadrons of his division. Similarly, in the critical days preceding the battle of Sedan, Staff Officers, especially those of general headquarters, accompanied the cavalry in the numerous reconnaissances which were made in order to ascertain exactly the situation of the enemy. In 1866, too, this was frequently done. At the beginning of July, the Prussian headquarters was not thoroughly acquainted with the movements of the Austrians, who had concentrated towards Königgrätz. On the 2nd, the advanced posts encountered each other without either army having suspected the proximity of the other. In brief, the necessary information regarding the position of the Austrians was obtained by small exploring detachments, one, conducted by Major von Unger, Staff Officer, with an escort of Uhlans, and another, under Lieutenant von Bülow, with two Officers and twenty hussars. The information obtained by these Officers was so complete and important as to enable the Prussians to make the necessary dispositions for a combined attack the next morning. The appearance in front of the outposts of these small Officers' patrols, without any support whatever, could not cause the Austrian headquarters to suspect the immediate proximity of the Prussian masses, so much so that they were completely surprised next morning by the attack of the position on the Bistritz. A reconnaissance in force would have put the Austrians on their guard; it would probably have obtained smaller results, and would have given much more information to the Austrian than to the Prussian

headquarters. The account of Major von Unger's reconnaissance will be found in the "Histoire de la Guerre de 1866," by Fontanes.

2. *During the battle.*—As the distance of the cavalry division from the army diminishes, owing to the pressure of the hostile cavalry, the former will be more concentrated and the commander of the army will prepare to concentrate his forces. At this stage numerous Officers' and other patrols must hang on the front and flanks of the enemy, in order to ascertain and report the extent and force of his position. The army commander must have accurate and prompt information as to the force opposed to him. Just before the collision, the cavalry will naturally be compelled to fall back on one or both flanks of the line of battle, according to the orders of the army commander; but it will not on that account remain inactive; on the contrary, it must continue to explore, on its own initiative, towards the flanks and rear of the enemy. For this end, according to circumstances, patrols or entire squadrons must be employed. When the nature of the ground and available cover permit, it will often be advisable to establish a chain of patrols of observation at favourable points on the field itself, and when thus employed, to watch the course of events; frequent reports, even if of a negative character, should be sent in. In this case, complete arrangements must be made for forwarding reports to the proper recipients. The battle of Gravelotte shows us the important results that may arise from omitting a reconnaissance during the combat. The division of reserve cavalry (Du Barrail) in rear of the right wing, 1,600 or 1,700 yards south-east of St. Privat, neglected to patrol on the Conflans road. Had this been done, Bazaine would have been warned of the approach of a corps on the Conflans-Moineville road, and would have perceived that the design of the Germans was to envelop the right wing, that they did not wish to cut off the Army of the Rhine from Metz, but to throw it back under the walls of that place. Again, the badly executed reconnaissance of the division of Margueritte, at the beginning of the battle of Sedan, contributed much to the investment of the French Army. The Commander-in-Chief was long in ignorance of the movements to the west of Sedan, and the information obtain by the cavalry detachment sent to St. Menge, by order of General Wimpffen, came too late. In addition to exploring during the battle, the cavalry must watch over the security of the flanks and lines of retreat.

3. *After the battle.*—The strategic service of cavalry consists, for one side, in the pursuit, and for the other, in the protection of the retreat, and nothing is more difficult for both sides. Whenever possible, the beaten army will put off the *dénouement* till nightfall, and it is not easy to appreciate the right moment to complete the victory by a tactical intervention of the cavalry, and for the latter to resume its strategic service, properly so called. In 1870, the German cavalry had much trouble in finding MacMahon's army after the battle of Woerth. Two divisions, and afterwards four, were charged with this duty. If the pursuit occurs immediately after the combat, the cavalry again pushes to the front to resume its service of information and cover the front. The detached parties follow the enemy step by step, harass his

columns, and endeavour to seize his baggage and make prisoners. The mass of cavalry, which follows with its artillery, must be kept informed of the direction taken by the enemy, and favourable moments for making a bold dash on his flanks or interposing between the main body and rear-guard must be indicated.

If the enemy has been able to continue the combat into the night, numerous patrols must be launched forth in order to keep the contact with the retreating columns, and these must be followed up by squadrons, and even special reserves, as soon as the roads are free. Thus prepared, the strategic service can be resumed surely and energetically at daybreak, the main body of the cavalry then moving with its artillery in the direction where the bulk of the hostile cavalry is likely to be found. After Sadowa, part of the Prussian cavalry was put on the track of the Austrian cavalry, Hartmann's Division upon Pardubitz, to reconnoitre the march of the Austrians. He found the platform of the railway bridge removed and the bridge of the Elbe in flames, and at once collected the necessary materials, made requisitions for re-establishing these communications, and gained and transmitted to the 5th Corps all the information that they could require. On the 5th of July, Hartmann's and Wnuck's Cavalry passed the Elbe, and from that time hung on to the enemy. They had the good fortune to seize an Austrian carrying despatches, which completely revealed the projects of Benedek.

During the pursuit it may be well to add some infantry, mounted on vehicles if possible, to the main body of the cavalry division, or to the special reserves of the exploring squadrons if such are constituted. Frequent reports of traces and directions taken by the enemy must be furnished.

As to the cavalry of the vanquished army, it must redouble its vigilance towards the close of the battle, and if the retreat is decided on, it will have a double object, to cover the rear and flanks and prepare the way in front. The campaign of 1870-71 furnishes numerous instances in which but little use was made of cavalry to reconnoitre during the retreat. Thus, after Spicheren, the French cavalry gave no information as to the enemy's movements. The Germans, too, showed the difficulty of preserving contact while retreating; thus at Coulmiers, the 1st Bavarian Corps, with a numerous intact cavalry and without being pursued, lost contact for the time with the French, when it quitted the field so as not to remain in an isolated position. On the other hand, the action of the German cavalry in keeping up the contact while retiring after the battle of Bapaume was most judicious, and followed by very important consequences. Thus, during this phase of its strategic service the cavalry of the beaten army must cover the flanks and rear of the retreating army, and keep the main body of the cavalry well informed so that it may be able to oppose the enterprises of the hostile cavalry. Here, too, the pursuing enemy must be held on to by small parties, the object being not merely to protect the retreating troops, but to ascertain accurately the pursuer's strength and apparent intentions.

Should neither of the opposing forces retreat after a combat, but merely draw off to a short distance from each other, the work of the

cavalry will be as ever to explore and report on the enemy's position and movements. While detached parties of cavalry will thus endeavour to feel round his flanks and rear, much use will be made of cavalry, for patrolling and communicating purposes merely, in the infantry outposts which alone will be of any service under such circumstances ; but this subject I must leave to be handled by my colleague, Lieutenant-Colonel Lousdale Hale, in the lecture which we are to have from him next week.

In conclusion, I would draw one or two practical inferences, which would appear to form suitable bases for discussion.

1st. The strategic employment of cavalry being probably its most important service, are we keeping *au courant* with the rest of the world in the practice of the duties included under that head ? I venture to think that we might devote much more time to the practical instruction of Officers and all ranks in these particulars ; not merely theoretic and abstract instruction in the orderly or barrack room, but practical carrying out of exercises in the concrete on any and every kind of terrain available. The admirable "Uebungs Reisen," of which a short account will be found in the CVIth number of the Journal of this Institution, would furnish the groundwork for the sort of instruction required, but I fear that it cannot be carried out unless made compulsory.

2nd. Seeing that the duties of advanced scouts require exceptional aptitude, bodily and mental, would it not be feasible to organize in every regiment a cadre or class of scouts—call them éclaireurs or rangers, or anything else that will distinguish them—men who, showing a special fitness for the work, should be specially trained in all the duties required of the small parties who are to do the actual reconnoitring of cavalry ? Officers and non-commissioned officers differ as vastly as the men in their aptitude for this sort of work, and the non-commissioned officers at any rate could be included in the roll of éclaireurs. These men would have the best horses, and if no slight increase of pay could be allowed in these hard times, they might have some privileges which would make it an object of ambition to belong to the cadre. Of course, in theory, every man should be capable of performing the whole duty of a soldier; but while very raw material may be trained to do a great deal mechanically, that vigour of mind and body, that enterprise, self-confidence, and initiative which are required of every single man at the very front, cannot be looked for in the mass. Our Army being so small, the more highly trained should it be, and if we cannot ensure every one's being a model scout, we might at least do our utmost to develop to the full the requisite qualities wherever they can be discerned. Every man who can read should be taught to find his way about country with the aid of a map; ability to read a map is of far greater importance than skill in hachuring or taking angles with the prismatic compass.

Lastly, have we enough non-commissioned officers of experience to conduct such of the so-called "Officers' patrols" as cannot be provided with commissioned Officers ? No doubt the generality of our present non-commissioned officers would make excellent leaders, so far as

intelligence, dash, and bodily and mental activity are concerned, but we want more than this. Experience is wanted, and not merely experience, but a previous sound and thorough theoretic training which will enable them to enter into the general idea governing the operations they may be engaged in. The mere dead routine forms are easily acquired, but, as von Schmidt says, we must put life into them, and that can only be done by constant practice in all the duties that may fall to the lot of the patrol leader. I would then earnestly call upon all who have the real interests of our arm at heart to do their utmost to educate theoretically and practically the non-commissioned officers. We of the cavalry are quite accustomed to hearing our non-commissioned officers spoken of as the backbone of the Service, and we know what that means in the stable and barrack room; but, in the now most important duties of cavalry, I venture to think that more than ever will this term be applicable to them.

Works on which this paper is chiefly founded:—

- “Instructionen.” By Major-General C. von Schmidt.
- “Handbuch für Truppen Führung.” By C. von Widdern.
- “Der Strategische Dienst der Cavallerie.” By Lieut.-Colonel Walter.
- “Studien über Truppen Führung.” By General von Verdy du Vernois.
- “Etudes de Guerre.” By General Lewal.
- “Service d’Exploration et de Sureté.” By Colonel Bonie. (*Journal des Sciences Militaires*, December, 1878.)
- “La Tactique des Trois Armes.” By Captain G. Mazel.
- “Service Stratégique de la Cavallerie.” By Captain E. Libbrecht.

Colonel GOODENOUGH, R.A.: I could have wished that some Officers would have first made their observations upon the general scope of the lecture that we have just heard, but as no one rises, I may venture to make a few remarks upon one particular point which has been referred to, namely, the *Uebungs Reisen*. I have had some opportunities of seeing and hearing something about these *Uebungs Reisen*, or skeleton manœuvres, which are carried on in the German, Austrian, and I have no doubt other Armies also, for the instruction of Officers, and, to some extent, of non-commissioned officers. They are extremely valuable and important, and, as the lecturer tells you, there has been a description of cavalry strategical manœuvres of that kind published in the *Journal of the Institution*, translated from an Austrian paper by Captain Carmichael. For the benefit of those who have not read it, I would say the general scope of such manœuvres is that the bodies which might in real warfare be engaged in reconnoitring an enemy are represented by one or two Officers, with a very small staff of non-commissioned officers acting as orderlies and as messengers from column to column. The rule is, that no Officers should be put into impossible and absurd positions of command, that is to say, they carefully avoid putting any very junior Officers into positions which they would not be likely to hold in the field; nevertheless, it is not unusual to make a subaltern represent a squadron leader, or a Captain represent the commander of a regiment, and so on, but they take care to avoid any absurd contrast, so as not to give Officers tasks which their previous experience would not qualify them to perform. I had the advantage of hearing the system explained to me by the Inspector-General of Austrian Cavalry, Count Pejacevics, an Officer in whom the Service has great confidence, and he said, “I know very well that, whether the manœuvres are well done or not, at any rate, “my Officers have been over an enormous extent of country, and have been compelled to come to decisions, and put down those decisions on paper, upon information put into their hands a few minutes before when they are alone,

"without anybody to guide them or to turn to for advice, and that must necessarily cultivate the habit of rapid decision, coming to rapid judgment upon a question, "and they have, too, the inestimable advantage of going over new ground which "they did not know except by the map, and practising themselves in finding their "way across country by the map." In connection with that, I would remind you how often in manoeuvres at home, few and far between as they are, an operation fails because some Officer has not even mastered the A B C of his work of being able to find his way across the country by the map. Failures of concentration of columns on arrival at certain points occur from that cause, and that can generally be got over by practice of the kind here indicated. It would be of great value if persons who have an opportunity of being on the Continent could lay themselves out for getting an opportunity of seeing the *Uebungs Reisen* carried out. I believe it could be done if they take timely measures to get permission, and sometimes even without a formal permission a great deal can be seen. If they would present to the Service the result of their observations in a condensed form, suitable to our English mind, and to our English organization, they would render very great and inestimable service to the Army. I think, considering how seldom our manoeuvres take place, and the immense difficulties that must arise, from the cultivated nature of our country, in extending the system of annual manoeuvres to all districts, or in carrying on anything like manoeuvres on a large scale with troops, that these skeleton manoeuvres have a very great value to us, because they can be carried on with diminished expense, and particularly as regards the damage to the ground that is gone over by the troops.

General BEATCHAMP WALKER : The very interesting lecture we have just heard brings up so many recollections in my mind, that I could hardly leave the room without saying a few words, not in reply to, but in elucidation of it. Well I remember starting for the Campaign of 1866, when a great cavalry corps of 72 squadrons was formed under the younger brother of the King of Prussia, and which never was seen from the beginning to the end of the campaign. At the end of the battle of Königgrätz, all that came up to the Crown Prince was four regiments of cavalry under General v. Hartmann, and they were stopped by orders from the King, orders given, I have no doubt, from an excellent and humane feeling, but which certainly prevented me from seeing one of the great objects I had wished to see in my life, which was the pursuit of a broken army. At the same time, it would not be fair not to advert to the splendid manner in which the Austrian cavalry really did cover the retreat of their army. There was a pursuit on the part of the Second Army, commanded by Prince Frederick Charles, which was stopped by the splendid demeanour of the Austrian cavalry, which remained in great force, and sacrificed itself to cover the retreat. At the commencement of the campaign of 1871, the cavalry divisions came up quite late, after the rest of the army had taken the field, and the experience gained in that campaign has led to the plan that the cavalry in future in the German Army shall be mobilized before the infantry. For this purpose every Officer commanding a regiment of cavalry is bound, within the district in which he serves, to make arrangements with the horse dealers to supply him at once with whatever horses he requires to fill up the dépôt squadron left at home. A Prussian cavalry regiment can take the field at once. The peace formation being 5 squadrons of 137 horses, and the war formation 4 squadrons of 150, they can pretty well replace the useless horses which they wish to leave at home by taking them from the one squadron which is left behind, and the remount horses, which are at once bought and brought in by the dealers. I well remember the incident Captain Bell has referred to, of the reconnaissance towards Epinal. I was at that time in a little town called (?) Blamont, where most alarming reports were received of a large force having collected, and I remember the young Officers he mentions returning from their expedition, and being sent in by the General to make their report to the Crown Prince in person. Captain Bell has adverted next to the "Avant Postes" of De Brach, which I always call my military Bible, for it is about the most valuable book of study that has ever been written. My friend General von Verdy du Vernois has written a most valuable work, "Studien über Truppen Fuhrung." I happen to know the country over which he pre-supposes this division executes its advance, and I could hardly have conceived that any man not having served as a cavalry

soldier could have given so vivid a picture of what might have taken place. It is a book I read over and over again, and if I was only as rich a man, I would do as Lord Tweeddale did with the work of General de Brach, I would put my hand in my pocket and pay for its translation, because I cannot conceive any book that would be more instructive to cavalry Officers than this one. It goes into every question connected with the question of cavalry covering the advance of an army. I have already adverted to the point that, at the commencement of hostilities, the whole of the cavalry at the disposal of the country ought to be shown in advance of the armies, that is to a very great extent the plan now contemplated in Germany. I think we can hardly take General de Galifet's criticism of the French Officers as being anything typical of what we should say of our Officers. I hope we should find in a regiment more than one man per squadron who could be employed in a charge of patrols. In the German Army, I think every Officer would be taken. Our Officers ride well, they are generally well mounted, and I cannot think that we are reduced so low as that we should only have four Officers in a regiment capable of patrolling. After all, no very great science is required for this patrol duty. A great many of our Officers ride to hounds, and a man who rides well to hounds, if he attempts to ride forward at all, must be an observant man, and generally has brains enough to apply himself to other objects when placed before him. I really hope, therefore, that this criticism does not apply to us. As regards non-commissioned officers, I consider that, pains now being taken to instruct the non-commissioned officers in field sketching and in reconnaissances, we may in a very short time produce, I may say, almost unexceptional non-commissioned officers who would be fit to take charge of such patrols, and I look forward with great confidence to the results of this instruction. I am happy to say I hear a good deal of what is going on, and in nearly all the regiments this instruction is given by Officers of the regiment. I have taken particular pains to keep the gentlemen who belong to my department from doing more than lend general assistance in the way of advice, and as far as I can learn, the Officers of the different regiments are carrying out this instruction in a very efficient manner. I therefore hope that this criticism does not apply to us.

Captain COLVILE: I would venture to make one remark on a matter of detail which has not yet been referred to, and that is as to the necessity which appears to exist that every cavalry Officer should be a good linguist. It is not likely that the English cavalry will be employed in any great measure, except on the Continent, therefore it may be very necessary that they should be good linguists; and it is not very easy for them at the present time to become so, in consequence of the present system which necessitates Officers going on leave in the winter. Naturally cavalry Officers are fond of sport, and being obliged to take leave in the winter, devote their time to hunting and shooting, which is also most desirable; but if Officers were allowed to take leave whenever it was most convenient to spare them (of which their own commanding Officers would be the best judges), at any time of the year, a great many would forego hunting and shooting, and take their leave in the summer, travel abroad, become linguists, and also become acquainted with the topography of foreign countries. It is hardly worth while for an Officer to go abroad for the fortnight usually granted during the summer, and which is generally taken during the Derby week, when there are greater attractions at home; but if the present system of leave were altered so that Officers could always take their two months and a half at any time in the year, they could travel abroad, and regiments would not be crippled by having half their Officers (one might say) compulsorily on leave during a certain season of the year.

General BEAUCHAMP WALKER, C.B.: It was rather curious, but this morning I was employed in correcting proofs for Major Clarke, of the Artillery, of the 16th section of the Prussian official account of the war of 1870-71. It is not published in English yet, but it is both in German and French; and I recommend anybody who can lay hands on it to study the use made of the cavalry divisions in the advance on Le Mans under Prince Frederick Charles. There were four army corps in the field, and three divisions and I think two independent brigades of cavalry. It is a remarkably curious study—the maps are given day by day—to see the way in which each flank was protected by a cavalry division, and in which the connection was

kept up between an army advancing over so enormous a space as that covered by the commencement of the movement after leaving Orleans and concentrating towards Le Mans.

The CHAIRMAN : Before moving a vote of thanks, which I know you will all cordially give to Captain Bell, there are a few points on which I should like to make a few remarks. One was the reference made to mounted infantry. I think the tendency of war in the present day will be to increase the value of the more rapid marching of infantry. With this view arrangements might be made to assist their marching power by providing a certain number of carts for the transport of a portion. Again, I think a small portion of each infantry regiment should be mounted. At present infantry cannot move safely without an escort of cavalry for reconnaissance and scouting. With a few mounted men of their own in front and on each flank, infantry would be able to move with comparative safety where no cavalry were available, as lately in the Transvaal. I should like to see about twenty cast troopers attached to every infantry regiment, on which a certain proportion of men who are naturally fond of horses should be trained to ride and drive. Then, if you require to move your infantry the thing will be done; but you cannot teach an infantry soldier to manage a horse in a day, and unless the Government will furnish the infantry with a certain number of horses in peace time, I do not see how it can be done. My own idea about soldiers is that every soldier should be trained and taught something besides that special branch of the Service to which he is devoted altogether. I quite as keenly advocate the training of the cavalry soldier for dismounted duties as I do the training of infantry soldiers to a certain degree for mounted duties. I think in peace time you could scarcely find a man whom you cannot advantageously teach something beyond his mere routine duty. During his service in the Army we ought to qualify him for some trade useful for military purposes, whether pioneering, signalling, driving, or shooting, or whatever it may be. I think each man certainly at the end of a couple of years ought to have been trained to some use which would be beneficial to the Army in war. Captain Bell, at the close of his paper, alluded to a scouting class. I have long thought we do need to set apart a proportion of men who have a natural aptitude—quickness, fond of riding, quick of eye—for what I may call scouting. They would be quite a distinct class from non-commissioned officers. In non-commissioned officers you want character and conduct as well as other points, but there are in every regiment a class of men who never have character and conduct to be promoted to non-commissioned officers, but who might be very valuable if, without much regard to character, they could be trained as scouts. Give them a small increase of pay, and you would find them a most useful body in war. General Walker referred to the subject of finding way by maps. A good deal of attention has been given to the instruction of non-commissioned officers and men in maps of late years, but hardly quite as much as we should like if the Department were more liberal in providing maps and drawing materials, but I think we have done as much as we can, and certainly at Aldershot this season parties of Officers and non-commissioned officers, as suggested by Colonel Goodenough, have been sent out to explore the country, to find out their way by means of maps, and to bring back a report of what they have seen. A good deal of time was given by Captain Bell to the question of width of front which a brigade or regiment of cavalry should cover, and what should be the depth of the screen. I do not think these are points which it is profitable to discuss, because it must always entirely depend upon the nature of the country and the tone and temper of the enemy and the force of the enemy. Then there is the great question of holding "touch;" that is the most difficult thing in the whole world. If you push forward large bodies you get into contact and you get into a scrape: you do not want your outposts to fight. And if you employ smaller bodies, it is very doubtful as to whether you can get the real information you want. You must push through your enemy's screen, and if you push through his screen you are tempted to employ larger bodies of men and to get into a cavalry combat outside the line of operations, which is not the object of reconnaissance. Captain Colville made some remarks about the great advantage of cavalry Officers taking leave in summer. Of course he spoke as an infantry Officer. Infantry drill can be carried on as well in winter as in summer time; but cavalry drill can only be carried on in those seasons of the year when the ground is

sufficiently hard to enable horses to travel, and when the weather is sufficiently warm to allow men to sit upon horseback; and I do not see that we should do well in parting with our Officers during the drill season, in order that they may qualify themselves in the knowledge of languages, which might just as well be learned over the fireside in the winter. General Walker has alluded to the French idea that only four Officers of a regiment were worth much. Of course I am quite aware that there are a proportion of Officers who are as useless in peace as in war, but I really think we do our best, and certainly the tendency and tone and temper of the present day is to encourage Officers to do their best, and Officers very generously respond to that encouragement. I beg to move a vote of thanks to Captain Bell for his very instructive lecture.

Friday, March 25, 1881.

LIEUT.-GENERAL C. P. BEAUCHAMP WALKER, C.B., Vice-Chairman of the Council, in the Chair.

ON OUTPOSTS.

By Lieut.-Colonel LONSDALE A. HALE, h.p., R.E., Professor, Staff College.

GENERAL BEAUCHAMP WALKER, AND GENTLEMEN :

I am fully aware that in undertaking to lecture at this Institution on the subject of "Outposts" I am incurring the risk of being included in that class of individuals of whom it is said that they "rush in where 'angels fear to tread;" for of all branches of military art there is probably no one about which Officers differ more, whether with regard to its theory or its practical application, than this same "Outposts." And it is a characteristic of this divergence of opinion that not only do these Officers entertain the most profound belief in the value of their own views, but they have at the same time the most supreme contempt for those held by others. To come here, therefore, this afternoon to place before you a system of outposts evolved from my own inner consciousness or the result of literary research, would simply be to set myself up as a target, at which each "practical soldier" who takes part in the subsequent discussion will feel bound to discharge his most destructive missile; and the pleasure he will feel in doing so will be, I will not say enhanced, but certainly not diminished, by the fact that the target is a "Professor" and that the Professor is furnished from the most popular military educational establishment in connection with the Service. I do not, therefore, purpose to perform the act of "happy despatch," but I prefer to act as a base from which a discussion may start; and the best way in which I can carry out this object seems to be to place before you the way in which the principles of outpost duty are reduced to practice in the principal armies of the Continent; and inasmuch as in the course of the last ten or eleven years I have had, off and on, a considerable amount of instructional work in connection with outposts, and know, therefore, the difficulties met with in this duty, I hope it will not be deemed presumptuous on my part if in the course of the lecture I submit for consideration some conclusions at which I have myself arrived.

The outposts dealt with this afternoon will be the normal outposts, those prescribed in the Regulations of the various armies as the outposts, the spirit of which is to be followed when the letter cannot be obeyed. They are, therefore, the outposts of a force, in position it may be, or on the march, arriving on the ground in time to select the best line for the outposts, and to give to the outposts the most suitable

arrangement. They may remain on the ground for a day or two, and are within one or two days' march of the enemy. They are complete in numbers, that is to say, the body which they cover is numerically strong enough to supply all the échelons of the force; they are complete in all arms, mainly infantry, but with cavalry, engineers, and artillery also.

There will, therefore, be excluded from consideration "irregular" outposts, by which term is implied not the outposts used in warfare against uncivilized nations, but modifications of normal outposts in regular warfare; as, for instance, the *avamposti irregolari* of the Italians, which are outposts of a force arriving on the ground too late to select the most suitable line for the outposts, or to give them any systematic arrangement, and consisting of pickets thrown out on the lines of approach from the front and on the practicable ground between.

Neither will be dealt with the outposts of an investing force, as these are hardly normal, and moreover have been already fully described by General Beauchamp Walker¹ and Colonel Schaw² in the lectures they gave some years ago at this Institution with reference to the German dispositions in front of Paris and Metz respectively.

At the outset let me say that the sources whence I have derived the information contained in this lecture are the official Regulations of the armies referred to. I have consulted the originals in all cases, except those of Russia and of Holland. To Lieutenant J. J. Leverton, R.E., I am indebted for a very full abstract of the Russian Regulations, and to Captain Murray, 89th Regt., D.A.Q.M.G. in Dublin, for a similarly full abstract of the Dutch Regulations.

The objects sought to be attained by the outposts of all armies are four in number:—

1. To secure time for the main body to get under arms and ready to receive the enemy.
2. To obtain information respecting the enemy.
3. To prevent the passage of unauthorized persons across the outpost line.
4. To prevent the repose of the main body being disturbed.

But before proceeding to show how these objects are attained, it is desirable to say a few words with regard to the number of men employed on outpost duty. This number is a varying proportion of the whole force. The maximum is with the Italians, who allow one-third of the whole force to be employed in the case of an isolated division, but from one-fourth to one-eighth represents the average proportion in the various armies.

As regards the number thus employed, two remarks, inconsistent with each other, are sometimes made. The first is that the number employed is too large, and consequently the force will be exhausted in the performance of the duty. It must be remembered, however, that security no more than victory can be obtained save at the sacrifice of human life;

¹ Journal, vol. xv, page 806 *et seq.*

² Vol. xviii, page 18 *et seq.*

and it would seem to be a penny-wise and pound-foolish policy to refuse to sacrifice a few men at the outposts, if by so doing the result will be beneficial to the main body. The other remark is to the effect that the outpost force is too small to offer effective resistance. This remark seems to be founded on a misconception of the nature of the attack outposts are intended to meet. It is not absolutely impossible that a body of troops may find themselves attacked at night, as was Marmont's corps at Laône, by an enemy advancing in fighting order across country, but such an attack is in the highest degree improbable, and it is against probabilities, not possibilities, that outposts have to guard. The attack which outposts are posted to meet is that of an enemy advancing along the roads and other lines of approach, preceded by advanced guards and adopting the ordinary measures of precaution. An enemy advancing to the attack is never quite sure as to the exact position of his adversary; he does not wish to fall into any trap, and he moves forward more or less cautiously. It is this advance that outposts are intended to oppose and still further to retard.

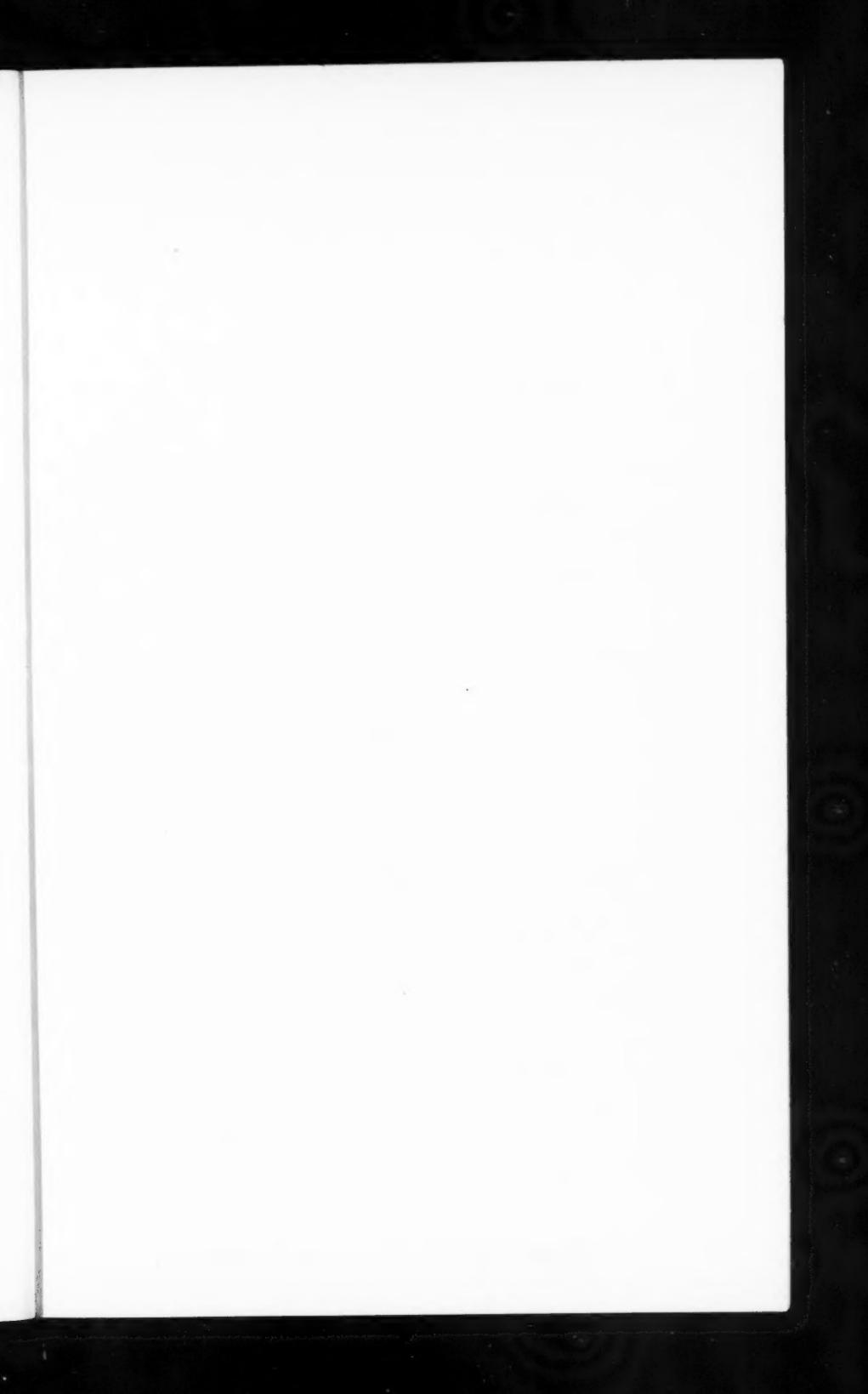
We will now proceed to consider the methods adopted to attain the first object, "to procure time for the main body to get under arms and "ready to receive the enemy," which together with the second, "to obtain "information respecting the enemy," and which is, in fact, a part of it, is the primary object of all outposts, that compared to which all others sink into comparative insignificance. So much importance do the Germans attach to this object of procuring time that it is in their Regulations assigned as the principal end to be kept in view by commanders of outposts in all circumstances whatever; and it is, moreover, one of the two data, the only two on which these commanders have to arrange their force, the other being the "general situation of affairs," a subject to which attention will be specially directed in a subsequent part of the lecture.

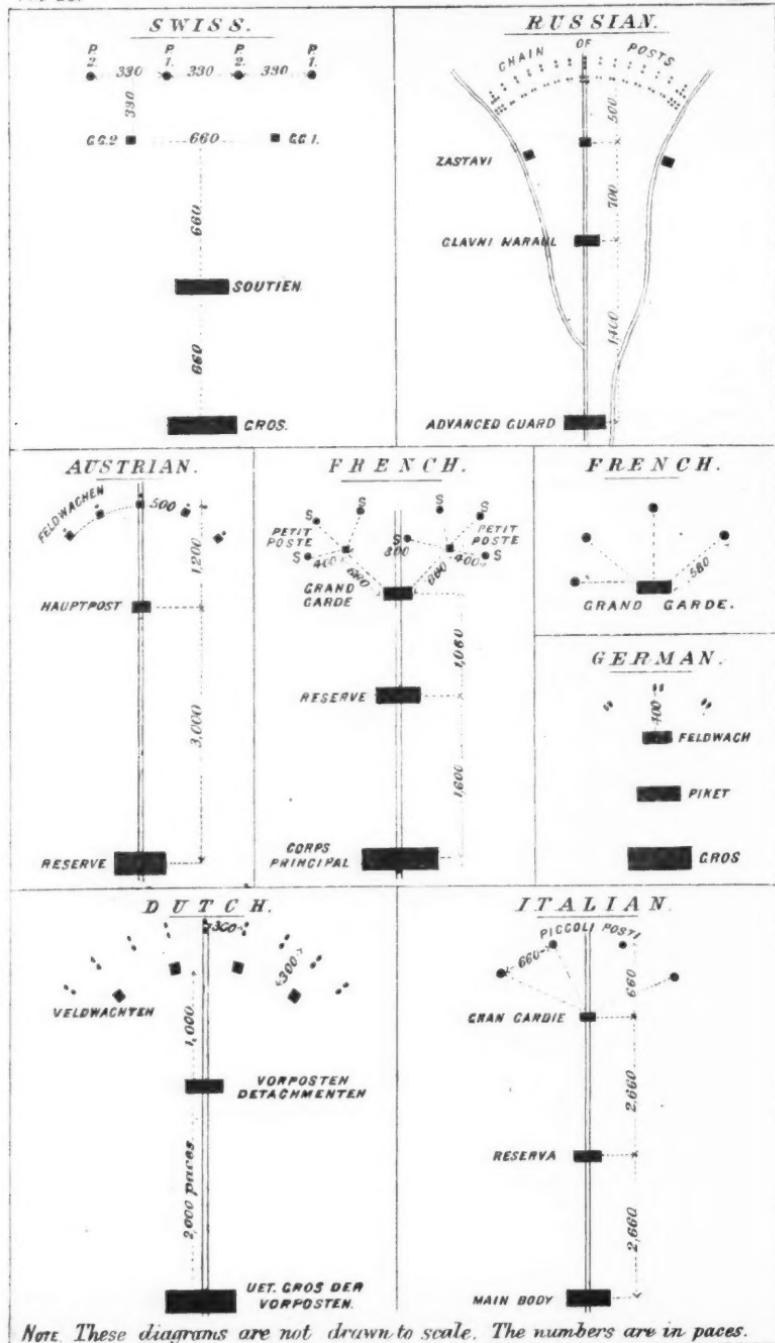
To attain this object, then, outpost forces are divided into two portions, one the smaller, the other the larger, to each of which a distinctive task is assigned.

The first, the smaller portion, is constantly on the move, collecting information about the enemy; the larger portion is stationary, and contributes its share to the general result by looking out for, resisting, or both looking out for and resisting, the advance of the enemy. It is with the work done by the smaller portion that I shall deal first, because not sufficient importance has been attached to it hitherto in our own Service.

In connection with this matter, it must be remembered that outpost duty cannot be thoroughly performed until both cavalry and infantry work together at it in close co-operation.

In the German Regulations we read :—"The connection of the two "arms, and co-operation between them, is a necessity for carrying on "outpost duty. Seldom, and only at greater distances from the "enemy, will cavalry alone be able to perform the task thoroughly, "and yet more seldom, and only under very peculiar conditions of "ground, will infantry be able to do this, unless aided by cavalry. "In all outpost exercises, therefore, where the nature of the garrison





Note. These diagrams are not drawn to scale. The numbers are in paces.

"renders it feasible, and in working these, must care be taken to aim at thorough co-operation of both arms." Whilst the Italian "Instructions for Outpost Duty" treat equally of infantry and cavalry, "because," so runs the wording, "Officers must know equally about what concerns both arms, on account of the frequent connection between them in the *servizio di sicurezza*."

In the task of procuring information both cavalry and infantry take part, but over very different areas of ground. Infantry patrols do not, even in the German outposts, go much more than 2,000 yards beyond the sentry line, and the distance that can be traversed by men on foot must necessarily be comparatively small. The information obtained by infantry patrols must, although very important, be necessarily gleaned from the immediate vicinity of the sentry line. But there is not unanimity as to the extent to which patrolling should be carried. Dutch, Russians, Germans, and Austrians practise patrolling extensively, whilst the French, as regards night work, say: "At night time patrols are sent outside the line of sentries only exceptionally, and then they are composed of very few men." Whilst the Italians, although giving definite instructions as regards patrolling, and recognizing the value of the practice, say:—"Patrols must not be too numerous, because the duty is very fatiguing, and much and continual movement at the outposts keeps up a constant state of disturbance, which is injurious, and at night may become dangerous."

It is to the cavalry that we must look to obtain for us the greatest amount of, and the most important, information, a fact which is perhaps not fully recognized in our Service, owing to the rare occasions on which the two arms act together. No limit is laid down in the Regulations as to the distance the cavalry should patrol to the front. Cavalry can hardly go too far or too often; cavalry should be conspicuous by its absence from the main body of the outposts. All experience shows how little Officers in command of a mixed force understand the working of cavalry, and how feebly is realized the real mission of cavalry, namely, to reduce to a minimum the inconveniences of time and distance which beset commanders in the field, and at the outposts as elsewhere.

It is true that both the French and the Germans allow the employment of cavalry as stationary outposts in advance of the general line of infantry outposts, behind which they retire at night, the Germans allowing the cavalry patrols to remain out in front on the roads at night. Cases may occur in which cavalry may act with advantage as stationary outposts in a mixed force, and with considerable economy to the employment of the troops.

A good instance of this use of cavalry occurred on the 13th and 14th August, 1870, when the 1st German Army Corps bivouacked on the east bank of the French Nied, 10 miles from Metz, its divisions being on the two roads to Metz, crossing the stream at Landonvillers and Courcelles Chaussy, 2 miles apart. Each division threw forward on to the western bank a strong advanced guard, which was écheloned on the roads. The outpost line extended at right angles to the roads from St. Barbe on the north to Ogy on the south, a distance of 4 miles,

this line being 4 miles in advance of the main body of the corps, and being composed of two squadrons of divisional cavalry.¹

But the circumstances of the case were in many points of an exceptional character.

The Italians make a good use of cavalry as *posti d'aviso* parties of from three to sixteen men each, pushed forward some 1,600 to 2,000 paces beyond the infantry sentry line, on to points whence a good view can be obtained towards the enemy, particularly of the lines of approach, bridges, and main roads by which he can advance.

Similarly the Swiss allow pickets of cavalry to be pushed to the front for purposes of observation, but they are to observe, and are not intended to fight.

It is submitted that with regard to the employment of the cavalry, with a mixed force at the outposts, the views held by Colonel Baron Waldstatten, of the Austrian Army, and given in his admirable work "Die Taktik," are correct; that inasmuch as so long as the enemy is within 9 miles of the infantry sentry line, an attack during the day is possible, it is to this distance, the minimum laid down for the cavalry patrols in the Austrian Service, that the cavalry patrolling must extend; moreover, that at each *Hauptpost*, and for orderly work, some cavalry will be required; that three or four squadrons must be forthcoming for the performance of all these duties, and that therefore, in a mixed force of ordinary strength, there will not be any cavalry remaining available for stationary pickets. Patrolling and orderly work is the task therefore of the cavalry at the outposts.

We will now proceed to consider the way in which the stationary portion of the outpost force perform their share of the task of securing time for the main body. There are three means employed:—

1. Observation: Where outposts rely on seeing the advance of the enemy in sufficient time to give the necessary warning to the troops in rear.

2. Resistance: Where this time is obtained by opposing, and thus delaying, the advance of the enemy.

3. Observation and resistance combined: Where both are relied on equally.

The first is employed by the Russians; the second by the Austrians, French, Swiss, and Dutch; the third by the Italians.

The Russian outposts consist of front line, approximately 2,800 paces from the main body, of sentry groups (*posti*), each of five to eight men, on the lines of approach, or at the principal points in the chain, with intermediate posts of three to four men. These groups are from 100 to 300 paces apart, being at night or in fog drawn closer together if necessary; they should be posted so as to see the whole intervening country, and so that no one can pass between them unobserved or unheard. The posts on the roads act as examining groups. Of each group one man is on the look-out, and a second man (*podtchassock*) is with the rest of the group ten to fifty paces in rear,

¹ Presumably 130 strong each.

on the watch for any signal given by the look-out. In rear of the *posti*, about 500 paces distant, are the supports (*zastavi*), each of eight to twelve men; they are points for the collection of information which has come to the knowledge of the groups, they are near the principal roads leading from the enemy, and at cross roads, so as to be easily found, and to be able to support the groups; of these supports, there are usually two or three to each company. The reserve (*glavni karaul*), if there is one, is posted on the principal road leading through the chain from the enemy at a distance from the supports, varying from 350 to 700 paces. The line selected for determining the position of the outposts is that which the sentry groups are to occupy. The troops on this line are first posted, then the supports, and it may happen that the whole of the force is expended in the formation of these two lines, especially in wooded or broken country, where a large number of supports are required. In this case there is no reserve, but as a rule, and save in special circumstances, half the company would form supports and chain, and the other half the reserve. When the chain is so far from the main body as likely to run the risk of being cut off, or too near to it to afford time for warning the main body, a general reserve is inserted between the company reserve and the main body.

The *Sékréti* is a noteworthy part of the system. *Sékréti* is the name applied to groups, each of two or three resolute men who, taking with them their arms and ammunition, place themselves at nightfall secretly in front of the chain to protect it from the unexpected attack of small parties or individuals. *Sékréti* are used especially in Asiatic wars, and in the investment of fortresses, when the enemy, taking advantage of close country, or of his own defensive works, can attack unexpectedly. They are posted only at night. Positions for them are selected during the day, care being taken, however, that the enemy does not watch the selection. *Sékréti* are not relieved during the night; they do not challenge, neither are they visited by patrols. If the enemy rushes unexpectedly on a *Sékréti*, the latter must fire a shot, even if it be into the air, to give the chain warning of the threatening danger. At daybreak the *Sékréti* retires without waiting to be relieved.

The Austrian system is essentially one of resistance. The commander of the outposts determines the position to be taken up by the *Hauptposten* and the extent of ground to be guarded by each. A *Hauptpost* may consist of half a company, or of several companies, according to the importance of the posts, and the resistance to be offered. The *Hauptposten* are stationed in the neighbourhood of the most important lines of approach, and where possible, at such points as command the communications, and permit a strong local defence. The retreat is to take place only after all means of defence are exhausted. At a distance of, as a general standard, from 2,000 to 3,000 paces behind the most distant *Hauptpost* is the reserve, composed of half the whole outpost force; it is kept together or broken up into portions, according to the nature of the country, being posted always in respect to the lines of approach. It is usually composed of all

arms, and its mission is to accentuate the resistance offered to the enemy. Some 1,200 paces to the front, and 400 to 800 paces apart, are stationed look-out posts (*Feldwachen*), composed of one *Under-officer* or *Gefreite*, and six to nine men; at important points, or on the main lines of approach, they are under the command of a subaltern. Although it is, as before mentioned, permissible for a *Hauptpost* to retreat after having exhausted all means of defence, the occasional necessity for self-sacrifice is not overlooked, as the following paragraph shows.

" All Officers and soldiers employed on the service of security must, " impressed with the great importance of the duty, be ready to " sacrifice themselves for the safety of the main body."

The French system is similar in spirit to the Austrian system, though slightly different in form. The line of the *grand' gardes* is the governing line; these *gardes*, usually each a company strong, are placed in the vicinity of lines of approach; in case of attack, they offer a stubborn resistance, falling back on the reserve, which, composed of one-half the whole force, is usually placed some 800 to 1,060 paces in rear, near the principal road by which the enemy may advance. Each *grand' garde* pushes forward 530 to 660 paces to the front a party equal to half its strength, which is formed into *petits postes*, which, reserving one quarter of the *poste* for patrolling duty, throw forward 260 to 400 paces to the front double sentries the same distances apart.

In broken or wooded country posts of four men and a corporal replace the line of *petits postes* and double sentries.

In the Swiss Regulations we read :—

" The service of protection at the outposts consists in closing the roads leading from the enemy towards the main body, by occupying and defending the positions which command these roads.

" For purposes of defence, the ground to be covered by the outposts is divided into as many sections as there are roads leading from the enemy. Several of these sections are formed into one principal section. To each principal section is assigned a *corps de sûrete*, which allots the subsections among its subdivisions."

The first duty of the commander of the outposts is to select a position for defence, and if several such exist he designates which of them is to be the principal one.

The force being divided into *gros*, *soutiens*, and *grand' gardes*, he regulates the strength of these respectively, according to the situation of the position of defence in the zone his force occupies. If it be near the rear the *gros* is made strong, but if to the front the strength of the front échelon is increased. When the line of observation represented by the *grand' gardes*, with their double sentries, termed *petits postes*, is coincident with the position for defence, the *soutiens* are moved up close to this line. A *grand' garde* may consist of a whole company, or perhaps only a quarter of a company. The *grand' gardes* are not further apart than 660 paces, the *petits postes* being 330 paces to the front and that distance apart. The *soutiens* are not more than 660 paces in rear of the *grand' gardes*. An

inlying piquet is sometimes formed in addition to the *gros* as a second reserve.

The Dutch system is essentially one of resistance. The governing line is the line of resistance, which may be in line with the supports (*vorposten detachmenten*), or with the reserve (*uet gros der vorposten*), rarely in line with the piquets (*veldwachten*). The reserve, half the whole force, is first posted, then the supports, each at least sixty to eighty men, 2,000 paces in front, are each given a section of ground to occupy, and the piquets, each about forty men, are then posted 1,000 paces forward; double sentries being placed 300 paces in advance. The line of resistance is usually in front of the reserve, or where the supports are: the piquets are not intended to resist. The supports are placed on the main roads leading from the enemy. It is a peculiarity of the Dutch system that the line of supports may be that on which it is intended to offer battle.

The Italians rely on observation and resistance equally to secure time. The front line, which is that of observation, consists of groups (*piccoli posti*) each of three to four men, under a commander, and posted at such a distance from the main body that they will be able to give notice of the approach of the enemy in sufficient time to enable all troops in rear, including the main body, to get under arms and be in readiness. Behind the *piccoli posti* are the two lines intended to secure time by resistance, and consisting of a line of *gran guardie* and a *riserva d'avamposti*, and posted sufficiently far in advance of the main body to secure the time by the resistance offered.

The commander would find little difficulty in posting the troops to secure the time in these two different ways, were he not, however, hampered by a third condition, namely, that the *riserva* is to be near enough to the *gran guardie* to come to their assistance, and the latter are to be near enough to the *piccoli posti* to afford them support. It must be difficult sometimes to comply with all these requirements, which must occasionally be of a conflicting character. The normal maximum distances apart of the échelons are from *piccoli posti* to *gran guardie*, 660 paces; *gran guardie* to *riserva*, 2,600 paces, the *riserva* being the same distance from the main body. The troops of all the échelons are posted with regard to the approaches.

The system of outposts in the German Army I have reserved to the last, not only because it cannot be classified with any of the systems described, but because I am anxious to direct your attention specially to it.

The German system is a very simple one; but its execution could with safety be left only in the hands of men in, so to speak, high military condition. Their Regulations point out the close interdependence between security and information respecting the enemy; possession of information being in some cases security itself; and they further admit forms only because some forms are an absolute necessity for training troops and securing uniformity in working together. The forms they adopt are a front line of *Feldwachen* of thirty to forty men each, detaching double sentries some 400 paces to the front, but only so many of these as shall allow one-third of each

Feldwach to be available for patrolling. In the rear is the *Gros*, a reserve forming the nucleus for resistance and a reservoir whence can be drawn reinforcements for the troops in front.

It is the position of *Gros* and *Feldwachen*, and the posts to be occupied by the sentries day and night, that the commander of the outposts determines; but when we look for distances or numbers by which he is to be guided, we find of the former only the 400 paces and the thirty to forty men just mentioned, and of the latter only the instructions I quoted in an earlier part of the lecture, the "general state of affairs and the time the main body requires to get ready for action." He has the option, should he think fit to exercise it, of posting on intermediate points between the *Gros* and the *Feldwachen*, or on important points in the *rayon* of the outposts, or perhaps at night only, other posts termed *Piquets*.

The foregoing short statement contains everything of a definite character to be found in the German Regulations. There are dozens of writers from whose works I might have drawn specific information as to German practice, but in doing so I should have conveyed to you a very erroneous and an utterly false idea of the German system, which, as General Kaulbars shows so clearly in his readable and interesting book, is to leave entirely to subordinate commanders the mode in which the general principles laid down by the authorities is to be carried out.

Let me read to you some remarks on this subject which I have had the good fortune to receive from a very distinguished Officer in the German Army.

"As regards Outposts it has always been my idea that this important duty must be, as far as possible, freed from all trammels of detail regulations. General principles, of course, there must be, but the detail of carrying them out must be more or less left to the commander in question.

"The troops, as well those available or necessary for the Outposts as those that are to be covered by them, the country in which the outposts are placed, the time of day, the weather, the circumstances under which, and the enemy against whom, they are to be placed, are so multifarious and ever-varying that it is absolutely impossible to give instructions that would suit all cases. If you attempt to do so you would hamper the intelligent and energetic Officer, and would give many an indolent one a welcome excuse for any stupidity he may be guilty of, or any negligence on his part, for which, perhaps, no instructions, however minute, could under all circumstances provide.

"Put the same man in command of outposts in the same country and under different circumstances, and he will most certainly do it differently each time; and place two different leaders in the same country and under exactly the same circumstances, and even then in all likelihood each will follow a different line according to his own individuality, and each one may be right and successful. The great thing is that the man entrusted with this important charge should first duly consider what object is to be attained by his outposts, and

" then how he is to do so. I have never forgotten the saying of the General under whom I made my first manœuvre, and which I then heard regarding outpost duty, which was—

" 'Do what you will, but give me a sensible reason for what you do ;
" 'never act without one.'

" Since then I have had innumerable opportunities of referring to the dictum, and it is my aim to lead all under me to act up to it. The General in question never blamed any measure in outpost duty without first asking the man, ' What was your idea in doing so ? ' and very often refrained from blaming measures perfectly at variance with his own ideas if the man only proved that he had first well reflected on what he afterwards did.

" Men learn more and generally work better when left as much as possible to their own intelligence, instead of being tied and bound by unnecessary leading strings."

Such is the spirit of German military training.

The normal arrangements such as I have briefly sketched are for the daytime ; as a rule, the codes allow slight modifications of position for night outposts. The Dutch object to alterations, and point out that the posts will probably have been strengthened for defence during the day. The Austrians do not allow sentries to be drawn in at night, but introduce intermediate posts (*zwischen poster*) into the original line of *Feldwachen*. The Italians are very decided on this subject ; they reprehend strongly the practice of drawing in the outposts at night. " The arrangement of the outposts ought to be the same for the night as for the day ; the plan of bringing in at night the outposts nearer to the main body is ordinarily an inconvenient plan, because the need for security is at least as pressing by night as by day ; nor is it desirable to introduce fresh posts for night duty, because such an arrangement is uneconomical, and leads to confusion."

It is a saying attributed to the late Major Adams, that the army which first learned to march at night would win the next ensuing campaign, and that saying is probably correct ; moreover against the breech-loaders the night attacks offer many advantages over day attacks ; positions suitable for defence by day are as a rule equally defensible by night ; time and labour are hardly ever forthcoming in sufficient quantities at the outposts to allow of two sets of piquet posts being prepared for defence, and it seems therefore little short of suicidal, voluntarily to forsake and to give to an enterprising enemy the chance of obtaining possession of points which would have to be regained next day at perhaps a great expenditure of lives.

With regard to the third object—the second having already been disposed of—which is to prevent the passage of unauthorized persons across the line, the Regulations lay down that sentries are to be posted at such a distance apart as to prevent such persons crossing. There is considerable divergence of view as to what is the smallest distance sufficient to stop people passing. The Italians put their sentries 660 paces apart, and the Russians on the other hand admit of a reduction to 100 paces and even less ; but as a matter

of fact, this trying to carry out the second object must depend entirely on the way the first object is carried out. If everything gives way to the formation of the line of observation, and if, as is the case with the Russians, it is a matter of comparative indifference how many troops are left in the échelons in the rear, then undoubtedly there can be formed a sentry line, which theoretically will stop anybody attempting to pass through; but if, as in the case of the Austrians, the main point is the resistance afforded, then, on the number of troops required to obtain that amount of resistance will be dependent the number of sentries that can be put forward; and when again, as in the case of the *Grand' Garde* of the French, and the *Feldwach* of the Germans, from the body that furnishes the sentries a deduction is made of a considerable portion to act as patrols, it must be evident that them only in theory can be formed a cordon of sentries which will completely prevent all access to the ground behind. It would be far better in the face of actual experience to accept the permeability of the line of sentries. Anybody who has read the occurrences which took place round Metz and Strasburg must admit this. It would be far better, in the face of that experience, to accept the fact that no line of sentries, however close, is impermeable, and to make up for that by adopting the principle that a proportion of the advance line must be reserved for infantry patrols, and by paying far more attention to the practice of infantry patrols than has hitherto been given to it by our Service.

It is as well to bear in mind that even in posting a sentry line there may be different views with regard to the duties the sentries have to perform. Sometimes the sentries are intended to aid in resisting the attack, at others they are intended to afford what is called mutual support; sometimes they are intended merely to give warning of the approach of bodies or individuals, and sometimes to compel individuals or bodies to halt. It must be evident, that an Officer in placing a piquet would place his sentries in a very different manner, according as one of those four principles was the guiding principle to be followed, and the forgetfulness of the objects of sentries is sometimes the cause of divergence which occasionally exists between the commanding Officer of a battalion and his Officers in command of pickets. We have all of us perhaps received the reproof, "Why have you so many sentries; one man can see a mile "on each side of him?" Of course our reply would be "Yes, but "I would run the gauntlet between my own sentries 200 yards apart." The commander and his subordinate are viewing the same questions from entirely different stand-points.

The fourth object, that of obtaining repose for the main body, is closely connected with the important question of how far a sentry line should be from the main body. It is sometimes supposed, and it is laid down in our Regulations, that the outpost line should be so far from the main body that the main body shall be secure from the shell-fire of the enemy's artillery. Of the six different codes I have studied, the French are the only nation who allow this to enter into their calculations at all; and they consider, if the outpost line is distant 4,000 paces

from the main body, the main body will be secure from artillery fire. But that factor does not seem to enter into the calculations of any other Army. I should imagine the cases in history where a main body has really been disturbed by artillery fire are so few, that it is hardly worth while to take the question of artillery fire into consideration; and I would submit that there is no distance which is applicable to bodies of varying strength, as the distance that their outpost line should be from them. There is no one distance which is even applicable to the same body in different formations, and I should submit for your acceptance the conclusions arrived at by Colonel Max Thyr, an Officer in the Austrian Service. In his excellent work "Die "Taktik," lately published, Colonel Max Thyr declines to assign any specific distance, for he points out that the distance from the main body depends on a variety of circumstances, among which he includes the following: The size of the protected body of troops, the nature of their shelter, whether they are encamped in cantonments or bivouacked; the character of the ground occupied by the outposts, whether favourable or not for defence; the duration of the halt, whether for one or more nights; the *morale* and character of the troops which the outposts are protecting; and last, but not least, the character of the enemy, whether enterprising or not. If, then, we omit from our consideration this factor of the extreme range of artillery for the purpose of annoying the main body, the solution of the question can only be in German fashion, namely, that it must depend upon "the general "situation of affairs, and the time required for the main body to get "under arms."

Similarly with regard to the lateral extent of the outposts, how far they should extend to either flank of the main body, no Regulations prescribe this in any way; where danger is imminent equally all round, they say then the outpost force must be equally strong all round. It is not the province of the outpost commander, it is for the highest authorities to determine that question. It would be impossible in warfare to guard against everything that is possible; what we can guard against is, that which is probable only, and it is only the higher leaders of a force who possess information which enables them to say where the probable ends and the possible begins. It may seem that this is somewhat shirking the giving of definite replies to these two questions in leaving so much to the circumstances of the case; but the Germans themselves lay such great stress upon the circumstances of the case as attending the arrangement of an outpost force, that they say, "In all outpost exercises in peace time, save those purely of "a drill character, a General Idea" (which includes the general situation) "is to be given as the general basis of the exercise."

I have touched now upon nearly all the points which it is necessary to bring forward with regard to the principles of "outpost duty," and I would say a few words with regard to our own Regulations. It is not my intention in any way to criticize the Field Exercises, but it would be impossible for any man of ordinary intelligence to study the codes of half-a-dozen other armies without feeling that our Outpost Exercise is not altogether satisfactory; that there are certain ambiguities

perhaps which might be made clear, and perhaps some hiatus which requires to be filled up. It is, moreover, a question whether a revision might not be advantageous to the Service, and if such a revision were undertaken, it is to be hoped that two points will be borne in mind. The first is the necessity for giving more prominence to the duty of obtaining information, which duty has a subordinate position in our own Field Exercises. The best step to doing that would be to remove from the place which they wrongfully, I submit, occupy in the Infantry Field Exercise, the "Outpost Regulations." Outpost regulations and the way of carrying on outpost duty is a matter for the Army as a whole, and not for one particular arm of the Service. I would suggest that a small outpost duty book be written and issued separately as a section of the Army Field Exercises, in which not only instructions for what we call "outposts" should be given, but also instructions for that duty which is so intimately connected with it—the duty of obtaining information, according to German nomenclature, "Aufklärung-dienst" and "Sicherheit-dienst." The German "Verordnungen über die Ausbildung der Truppen für den Felddienst" is an example of the kind of work suggested.

With regard to the method in which the stationary outposts should carry out their part of the duty of securing time, it is to be hoped that the principle which already exists in our Regulations may be still further extended, and that the principle upon which the stationary portion is to be arranged may be of offering resistance on points on the lines of approach. I know that this can only be done at the expense of the sentry line, and I know in advocating the formation of a line of resistance as the principal point to be attended to, and at the expense of the line of observation, I shall not carry with me those Officers who lay great stress on obtaining a good line of observation for their outposts.

I would ask you to listen to the character of the two allies which offer themselves to you; they are rather two servants who want to enlist in your service; they both promise to you the greatest assistance in their power, and the plausible one is the "line of observation." If you assign to these two servants an equal amount of authority in your household, your household will soon be thrown into utter confusion. One must be superior to the other. Remember what are the characteristics of this one who calls himself "observation." Remember that treachery is a part of his character; it is innate in him. If you doubt it, take him out and wait until a snow-storm comes on, and then see what reliance can be placed on him; put him out at night, and see what value a "line of observation" is then: you will be shot or bayoneted before you have time to turn round in your blankets. In the meantime there is a "line of resistance" at hand, a servant who never fails you in any case whatever, valuable in summer or in winter, in fog or in sunshine, at midnight or in midday. The reason why the line of observation is thought so much of in our Service is, I venture to think, because most of us have seen it only under circumstances signally favourable to it, because we have few Generals so hard-hearted as to turn us out in a snow-storm to place our sentries, and to see what they will do

then; and we have no Generals so hard-hearted as to keep us out all night on outpost duty, and see what the value of the line of observation is in the dark hour which precedes the dawn. On the other hand, the line of resistance has not a full share of merit assigned to it, because few of us have been able to see it actually tried. The only way in which we are able to test it is by those erratic decisions which I, probably in common with others, have given at field manœuvres or "Kriegs-spiel," but nobody can fully appreciate the real strength of resistance by a force well intrenched and armed with breech-loaders, until he has had painful and practical experience of it. Therefore, while I would counsel the use and employment of both these servants in your service, I would ask you to make the "line of resistance" supreme ; get what you can out of the "line of observation," but treat him as a friend who at any moment may turn into a foe.

So much with regard to regular outposts ; and I may be allowed to express my regret that neither the Secretary nor myself have been able to obtain the aid of any Officer who has had any experience in irregular warfare to tell us how far our outpost system is inapplicable, or what modifications are required in it in warfare against tribes like the Zulus or the Afghans. This is the more to be regretted, as there is an idea present in the minds of some Officers that the training and study of regular warfare is of little or no good in the warfare in which English troops are ordinarily engaged. This was forcibly brought to my notice by a remark made to me shortly after I landed at Port Durnford, unfortunately too late to obtain any practical experience in this matter. A young subaltern addressed me as follows : "Well, "Colonel, how about your outposts?" (He did not mean my outposts, he meant the outposts of the "Field Exercises.") "How about "your outposts that you used to teach us? Mighty little good "have they been to us here." The subaltern was my host at the time, and had been living for six months, off and on, on trek ox, and his liver was certainly in no state for argument, still less for contradiction, so the abashed Professor shrank into his shoes. I rode down the coast afterwards with my warrior friend by my side, and he pointed out where the laagers and camps had been, and if he was here, I would have had him on his legs to tell us what I could not then find out, why the principles of our outpost regulations were inapplicable even in Zulu warfare.

In conclusion, I would, Sir, make an appeal to you of a personal character. The grade of Officers who have the closest personal interest in outposts, considered in their widest aspect, and on whom the subject has the most direct bearing, is the grade to which I myself belong, namely, the Field Officers of the Army, for on service the commanders of the outposts would usually be selected from among them. Taking up a line of outposts hurriedly in a strange country is, however, a branch of our work in which few of us have had any practical instruction, and I would, therefore, appeal to you, Sir, as on this occasion the representative of the General Officers, to give us increased facilities for perfecting ourselves in this important duty. It could be done very simply indeed. All that is required is, that the

General Officer commanding at a station should send down some morning, without any previous warning, to any Field Officer he may select, a "general idea," and that that Officer should be required to turn out at once, and within three or four hours send to the General his report of the arrangement of his troops across a particular piece of country. Nobody is disturbed in other work or taken from other duties save the Officer who has to make the report.

But when the report comes in, something else has to be done: it must be criticized, and the remarks, favourable or otherwise, upon it must be communicated to the Officer who has made the report. The work had better not be done if it is to be docketed with that zeal-suppressing remark, "Read and noted." If the work is worthy of commendation, commendation should be communicated to the Officer; if it is badly done, the Officer must be blamed. It is possible that the majority of my brother Field Officers may be such thoroughly practical soldiers that their work would deserve nothing but the highest commendation; but there is a minority whose work would, on the other hand, deserve a great deal of blame and censure. There is a minority of Field Officers in the Army, men who have not thought about this question, who have not studied it, who do not care about it, and who trust that some inspiration will come the moment they find themselves on active service in the charge of outposts. There is a minority who have thought a great deal about it, studied it a great deal, Krieger-spield it to distraction, perhaps written about it, even lectured about it, think they know a certain amount about it, and literally know nothing at all about it. To that minority it is quite possible I myself belong, and therefore it will be no offence to my brethren in the minority if I claim to address you as one of them on their behalf; and I ask you that you will harden your hearts, and if you find that our work is badly done, you will censure and blame us without reserve. I know the operation will not be pleasant either to you or to us; for I know it is repugnant to the General Officers of the Army to have to find fault with men who have arrived at a certain position and a certain age, inefficient, but more from the fault of the system under which they have been brought up than from any shortcomings of their own. It certainly will not be pleasant to us to receive your censures, and I dare say when they first come we shall not like them: our vanity will be touched, our pride will be injured, and we shall think we have been unjustly treated. But very soon we shall arrive at a better frame of mind, and we shall be glad indeed that the blow has fallen upon us; we shall be glad because it will have awakened us from the fool's paradise in which we have been slumbering—a veritable fool's paradise, because it has been one of self-deception. We shall be glad because we shall have been awakened to a sense of the deep, the well-nigh appalling, responsibility which rests on the shoulders of the commander of outposts on active service, and we shall be thankful that we have been awakened before it is too late, and in time to make good our professional defects at a less costly price than the blood, it may be the lives, of our comrades.

If the simple method which I have suggested for acceptance be adopted, I venture to think that within a very few months two advan-

tages will have accrued to the Service ; first, that the General Officers will know which of those amongst us are incompetent and inapt to perform this particular portion of our duty ; the other, which is by far the more pleasant aspect, namely, that we shall, under your guidance, have really become practical soldiers, that we shall be recognized by our comrades as such, and as men who have studied, and who know something of their profession, and who may be safely entrusted to procure for them on active service those two blessings which are so invaluable to a soldier on a campaign—security from surprise and undisturbed repose.

LORD CHELMSFORD : Our gallant lecturer made an appeal, saying that he was rather ignorant how outpost duty was conducted in Zululand. I am sure that if I had known that he desired the information I should have been only too delighted to have told him everything I knew regarding it. The fact is, in Zululand the principle adopted was that which the gallant lecturer really maintained as the right one ; that is to say, we adopted the principle of the line of resistance being the important one. The line of resistance was a very short one : the troops being always encamped in the form of a hollow square. It was not necessary to send the outpost's sentries to any very great distance, as every man in camp was ready to turn out at a moment's notice. The plan adopted by night was to send out sentries in groups of six, two standing on sentry whilst the other four lay down close behind them. They were not more, at the outside, than 300 yards from the camp, as that distance was considered quite sufficient in case of alarm to give the necessary time for those who were sleeping in tents to strike them by pulling out the poles, and fall into their places for the defence of the laager. The principle of having groups of six was considered desirable, as it gave the double sentries the close support of four other men, and thus increased the immediate strength of the sentry line. In the day time, generally speaking, there were no infantry sentries out at all, but the mounted troops were pushed forward some two or three miles, and posted as vedettes. They also fulfilled another duty, which was that of guarding the cattle, because, of course, with the large number of cattle we had with us, it was necessary to send them out to graze at some distance from camp, and it was necessary to guard against a stampede. The system was so simple that it is scarcely necessary, I trust, to explain the system any further. The camp itself was the line of resistance, where every man was ready to turn out and fall into his fighting place at a moment's notice, and the sentries were merely required to offer such resistance as would give time for the men to get into their places, when they would fall back at once. I am sure we are very much indebted to Colonel Hale for the most interesting lecture he has given, and I think, to a great extent, all the principles which he has advanced are sound, but he has perhaps laid a little too much stress upon the resisting line being the principal one ; because it appears to me it is so very difficult to obtain it. You will see, as a rule, that troops must be placed where they can get wood and water, and that, generally speaking, is in the low ground, whereas the resisting line would almost necessarily be on high ground. Of course a force might be encamped on a gentle undulating plain, where both might be found combined, but it could not always be the case. The resisting line must, therefore, sometimes be the one which the outpost sentries or pickets occupy. No hard and fast rule can be laid down, and it would, in my opinion, be a mistake to lay down that a line of observation is never to be made the line of resistance. With regard to the posting of sentries, the *piccoli posti* of the Italian Service I believe to be the right and the sound principle, more especially because it relieves the men who are on picket (which is a very fatiguing duty) of a great deal of unnecessary work. For instance, all those who have to adopt the English system of outpost duty must know perfectly well how long it takes to relieve your sentries, and what a distance the relief has to march ; whereas if you put the relief close behind the sentry, all that unnecessary labour is saved. So long as these *piccoli posti*—these small groups—are properly placed and posted, it appears to me you arrive at the most perfect

principle of an observing line that you can possibly have with the least possible wear and tear of your men's physique.

Sir EDWARD HAMLEY: Colonel Hale has given a vivid picture, which I am sure must have struck everybody, of the difficulties and complications attending the construction of any good system of outposts, and I can assure anybody who tries it that it will test all his knowledge and ingenuity to devise one. There are two or three points necessary to be considered on which the lecturer only lightly touched, and which I may mention. In the first place, in devising a system, it appears to me to be most important to come to some good understanding as to the proportion that should exist between the force of the outposts and the main body. It would not do to fix this arbitrarily; it would not do to say it shall be one-tenth or one-eighth, or any other proportion; it must vary according to the circumstances of the ground, and that makes the problem all the harder. The force must be such as to afford security, but it must not be so great as to harass the army in order to maintain and relieve it; and to reconcile these conditions is, of itself, a very difficult matter. Next comes the distribution or division of the various bodies forming the outposts, on which Colonel Hale has gone much into detail, and has shown us a great variety of systems. They look very simple on paper, but the difficulty is in applying them to the ground, and, as he says, practice is most necessary to ensure any kind of proficiency in this respect. Then there is a third matter on which I do not think he touched at all, and that is on the command and conduct of these bodies. I need not tell many of you, who know it better than I do, how difficult it is to command, and cause to act in unity, bodies so widely separated as these, and from whom so difficult a duty is demanded, namely, that of retreating in good order, without any confusion, and taking advantage of the accidents of the ground to oppose an enemy, whom we must suppose to be always superior in force from the circumstances of the case. These, then, are the points which anybody who tries to devise a system of outposts will have mainly to consider. I will not attempt critically to examine the several systems which Colonel Hale has presented to our notice, because they demand very careful consideration, and it would be presumptuous to do so on short notice. I will only say the feature he mentions as being a special characteristic of the German system appears to me to give it at once a pre-eminence—that of simplicity—which is most essential. On the other hand, the Dutch system appeared to me to offer the most doubtful and dangerous conditions, for I think he said it demanded that the outpost line should be the fighting line, and that the army should come up to reinforce that line. It is obvious, supposing any part of that line is carried by a sudden rush of the enemy before it could be so occupied, the whole arrangement would go to pieces. Further, as a matter of minor detail, it appears to me that sentries not only should not engage, but that they may probably be forbidden to fire, and should only signal the approach of the enemy. I think we must all feel how fully justified Colonel Hale is in saying that when other armies are engaged in such studies and exercises as these, it would be most unparable if we neglected them; and we are greatly indebted to anyone who like him will come forward and instruct us in the subject. I should not venture to say anything about it only that I formerly gave some attention to the subject and arrived at conclusions which I put forth in a small book; and I not only had the opportunity of coming to these conclusions theoretically, but of testing them in some degree practically, for the Officer commanding at Aldershot at that time wished to carry out some of my views, and furnished troops for the purpose; and a great many Officers, among them some high in authority, came to look on. I could not, of course, choose what ground I pleased; I was obliged to take what offered, which was not at all that I should have chosen. However, I endeavoured to make the best of it, and I may say that the result satisfied me that, had we been really engaged with an enemy, the outposts would have done their duty effectually in retarding that enemy sufficiently to enable the army to place itself on its guard. I will only further add that the encouragement I received on that occasion was not such as to induce me to extend my enquiries into the subject of outposts, either practically or theoretically. I beg to offer my own best thanks to Colonel Hale for a lecture which does great credit to him and to the Institution of which he is an eminent member. I have always thought that it is very proper that from the Institution the original invitation to

discuss subjects like these should proceed—subjects which are of the highest interest to the Army at large—and I am exceedingly glad that such has been the case in the present instance.

Mr. C. B. MAYNE, R.E.: Colonel Hale referred to outpost duty in Afghanistan, and said he should be glad to have some more information on that subject. The outpost duty in that country was very simple so far as it went. All our operations took place in the valleys. At Jellalabad the valley was over 20 miles wide, and formed a large level plain, so that there was no particular line of approach at all, and pickets were thrown out all round the camps. But these pickets were not thrown out very far. It was a known characteristic of the people that they would never attack in open day, and in fact there was only one instance in the whole of that two years' war in which they did make any attack on a camp, and that was on a moon-light night, at Fort Batty, which had only some slight breastworks. On that occasion they came up a ravine, on the edge of which the camp was, and on which the camp had often been warned that a picket should be placed to watch it, but, however, nobody ever placed a picket there; and it was up this very ravine that a large body of men came on this occasion, and attacked our post, killing one Officer and nineteen men before the troops could turn out, and even then, most of the Afghans remained outside the breastworks throwing in stones, and it was only a few plucky men who dashed in who did the damage. It was not the habit of the Afghans to attack at all, and in consequence the outposts were very small indeed: they rarely amounted to over one-eighth of the force. In the valleys round Cabul, you could not move across the country owing to the irrigation channels. The camps were generally pitched on whatever open space could be got, and the pickets were placed within two or three hundred yards of the camp on the rising knolls round. If we halted a day or so cavalry was sent out five or six miles along the valleys: the hills on either side were impassable for anyone to go over. We used to see watch-fires on the hills here and there, but no large bodies of Afghans ever came over them. On the line of march, cavalry went about three or four miles beyond the camping place and returned, but as regards actual night and day outposts, they were always within a few hundred yards of the camp. Patrolling was not very great, and patrols were sometimes fired on. In one case, at Gundamak, when horses were being stolen, the 10th Hussars sent out some patrols to try and prevent this thieving. One was fired on and the non-commissioned officer was shot in the arm; and the liability to such accidents rather discouraged patrolling at that time; but there was always patrolling when an enemy was thought to be near at hand. You could obtain the information you wanted to any extent by spies, and whenever there was a chance of an attack of any kind, the information was known days beforehand, and even then these fellows had to be attacked; so that the outpost duties were very simple.¹

¹ The camps were square-shaped, and whenever an outlying picket post was required, the nearest battalion supplied it. Each battalion told off an inlying picket which remained in camp and slept fully accoutred. The field Officer of the day had command of these outlying pickets and had to visit them by night and by day, and the field Officer next for duty had command of the inlying pickets. Most of the outlying pickets were withdrawn by day, only a few posts of observation being kept up, and the cavalry examined the valleys for a distance. These outposts were really more for police measures than for actual protection, as the outlying pickets were rarely more than 200 or 300 yards from camp, and generally covered themselves with small stone breastworks, behind which they slept, throwing out two or three single sentries to their front. These would prevent any large bodies of thieves getting into camp, while the quarter-guard sentries posted round the edge of the camp were supposed to stop solitary thieves. Sometimes, if much thieving went on, "shikar," or shooting parties of two or three good shots, were sent out after night-fall to hide and shoot anyone they saw without challenging: this was very effective. Special patrols at daybreak were often sent out when circumstances made their use judicious, but the troops rarely, if ever, fell in under arms before daybreak in case of attack. The only orders were that in case of an attack the

Colonel Sir LUMLEY GRAHAM, Bart. : I am not going to venture to take up your time with any criticism of my own on what our lecturer has so ably stated ; but he was kind enough to send me the headings of his lecture, and I remarked amongst them the question of the advisability or not of changing the position of outposts at night. I remembered reading, a long time ago, a little book written by the well-known Marshal Bugeaud, called "Instructions pratiques pour les Troupes en Campagne," and I remembered there was something in it about that very question of the position of pickets at night. I referred to it and found this. He says, "By day time it would be sufficient to occupy with very weak posts the commanding points from whence you can see afar off. It is by day that the eye guards you ; by night, as you cannot see far, it is necessary that your posts should be much farther forward." This principle is diametrically opposed to the received usages and "written rules of certain books ; but nevertheless it is according to good common sense." The practice he discusses refers more particularly to warfare in Africa, and therefore he gives certain details which were merely suited to the French warfare in that country, and are not worth mentioning here. At the same time, he says the general practice he advocates of pushing outposts more to the front by night than they are by day is applicable also to European warfare, and mentions how he himself practised it with success in Spain. He goes on to discuss an objection to this principle, which is raised by some people, that you expose your outposts to be captured by pushing them on so far. He does not think that is the case at all. He thinks that of course the people who place the outposts know the ground between them and their main body very much better than the people who are going to attack them, and, therefore, that with common care they will have no difficulty in retiring on the main body, particularly as the outposts are placed after dusk, and the enemy would not know exactly where they were, and if they did stumble upon them, they would be much more afraid of them than the outposts would be of the enemy : therefore, he thinks there is very little risk of the outposts being cut off. At any rate, he thinks it is very important that outposts should be pushed far to the front at night, so as to give security to the troops, and he certainly dwells rather on the "resistance" than the "observation." The Officer who last spoke mentioned a case in which, from want of precaution, there was a surprise in Afghanistan, and Marshal Bugeaud refers to the very sort of case himself. He says you must never suppose when in the field that an enemy, because he is not in the habit of making an attack in this or that way, will never do it ; but you must be prepared for any attack he may possibly make, and according to that, although the natives were not in the habit of attacking at night, he certainly would not have left any approach to his position unwatched. There was a point that Sir Edward Hamley had mentioned

men were to fall in as soon as possible in front of their respective lines, and wait for orders, the outlying and inlying pickets being supposed to be able to afford sufficient resistance until this could be done, but no definite or exact line of defence was told off in the temporary camps, though in the permanent camps or posts along the line of communication, the men were often practised in taken up their alarm posts. In some of the permanent camps, pickets were posted a mile or more from the camp, for observation only, and then they were provided with blockhouses. Most of the permanent camps, especially the small ones, were surrounded by high mud walls, which could not be rushed (Fort Battye was afterwards provided with them also), and in such cases, outpost duty of course was reduced to a minimum, as only a few sentries were required along the walls. The following is an extract from Brigadier-General Sir Thomas Baker's, K.C.B., orders relative to the troops on the line of march : "On arrival in camp, the field Officer of the day is to report to the Brigade-major, to post the outlying pickets, and to make the necessary arrangements for the security of the camp. The field Officer next for duty is to command the in-lying pickets (one company per regiment) the Officers and men of which are to sleep with their accoutrements on. All guards and inlying pickets are to parade with regiments when the 'fall in' sounds. The outlying pickets will receive orders according to circumstances as to the time of quitting their posts, and whether they are to form the advance or rear-guards of the column, or are to join their respective regiments."—C. B. M.

that was not touched upon by the lecturer,—the command of outposts ; and that reminds me of my little experience in the field in the Crimea. When we first marched up from the Alma to Sebastopol, we did place some outposts, and I was aide-de-camp to a Brigadier who had very advanced notions upon the question, and his idea was to place outposts very far to the front. In the same division, however, there was another Brigadier who took a totally different view of outposts and placed them within 100 yards or so of the camp merely as a sort of quarter-guard. About two days after we appeared before Sebastopol, we moved off to the left and took up a position for the night, not far from Kamiesh. We were ordered to place outposts, and the two brigades accordingly did so, each under the control of its own Brigadier. We found that our outposts were over-lapping those of the other brigade and a long way in front of them—something like half a-mile ; which certainly was a great waste of power, and might have led to serious mischief, and all that had to be changed. That led me, at the time, to think it was very necessary that one Officer should have charge of placing the outposts on each front of the camp so as to avoid any difficulty of the sort.

General HERBERT, C.B. : Colonel Hale has alluded to the section in the "Field Exercises" relative to outposts not being complete ; may I, therefore, be permitted to explain that at the time the first manœuvres took place there were no instructions for outposts with the exception of a few paragraphs, which detailed that there was to be an inlying picket and an outlying picket ? A small Committee was, therefore, ordered to assemble and to prepare a book on outposts, to be ready for the manœuvres. This was done in rather a hurry ; as may be imagined, it was incomplete, and little has been done since. Generally, therefore, I perfectly agree with Colonel Hale that many alterations are required. The exact system to be adopted for outposts cannot be laid down as a hard and fast rule ; the principles may. I agree with every word of that letter from the distinguished German Officer which was read by Colonel Hale. It conveys my views far better than I could convey them myself. In our Army, more than in any other, it is required that Officers should study the principles, study exactly what is wanted, study the ground, the methods of acquiring information, and the principle of when defence can take place, and when it is necessary to fall back, merely retarding the enemy ; but it is impossible to lay down definite rules for the distances between sentries, supports, or reserves. When at Aldershot I have often heard Officers ordered to move their pickets back, though well placed, because they were nearer to the sentries than the distance laid down in the instructions, the regulation distance had been measured, and the pickets or supports moved to the spot measured. I agree entirely with Colonel Hale in the principle that regimental Officers and company Officers should be left to themselves in the disposal of outposts, and that it is by instruction, not only of them, but of the non-commissioned officers and the men, that the necessary result is to be obtained. They must be instructed as to the meaning of outposts and the objects to be obtained. Many a time, going round the outposts, I have seen the sentries facing the wrong way and looking out towards their rear, no one interfering with them in the slightest degree. The Officers, having posted them at certain distances apart, considered that was sufficient. I am afraid what Colonel Hale said about general Officers sending general ideas to Colonels of regiments and field Officers, and requesting them to draw out a plan of the manner the outposts should be placed under the circumstances contained in the general idea, to be criticized by the General, would not succeed in our Army, because, usually, if a general Officer finds fault, or expresses his views, he is immediately called an old fool, an antiquated person who does not understand anything of the wants of the present day. When we have the new system in force, and fewer Generals, I trust there will be an improvement in this respect. I saw, when in Italy, that the principles of the Italian outposts were admirable in theory ; but for the practice I cannot say much. The small posts were, generally speaking, very well conducted ; but, as they rarely go off a road, they cannot be of much use. The systems for outposts required in various countries are very different. A man who in Ashanteeland followed the principles laid down in the Austrian, the Russian, or the French Armies would have failed ; and a man who followed the same principles in Zululand would have been wrong. From what I have heard of the Afghan War, they only had pickets and

inlying pickets, and the plan answered ; the fact being that everything must depend upon the circumstances in which you are placed, and upon the country in which you are working. In Germany there are large open plains, and the same in Austria, where you can follow out any principle laid down ; but in a thickly wooded or enclosed country, or a country like Zululand or Natal, no regular principle can be laid down ; we must study the wants of the country. If you remember, in the Crimea there were two battles fought on totally different principles, viz., the sortie on the 26th October, in which, by the orders of Sir de Lacy Evans, the pickets fell back and defended the line of the Second Division, and the Battle of Inkermann, when the division under Sir John Pennefather reinforced the line of pickets and commenced the battle on that line. Colonel Hale has hinted that we have had no experience of night duty. Having spent fourteen months in the trenches, I had a little experience of night work, and I am perfectly sure it is possible to place outposts at night so that they would prevent anyone passing ; but to do that, you must mix up the patrolling with the sentry system ; and by a combination of these, and with Officers constantly visiting their sentries, you can prevent a single man going through the outposts. At one time in the Crimea our trenches were constantly penetrated by an Albanian, who headed a party who came out to ascertain whether our sentries were well posted and alert. Our Officers knew as well as possible when these sorties would be successful ; they judged by the Officer who was in command of the party furnishing the outposts. I have heard young fellows in my own regiment remark, when the field Officer was detailed to command the advanced posts, "Oh ! we shall have a sortie of the Russians to-night ; " that old bloke is in command ; " alluding to some field Officer in whom they had no confidence. At another time they would say "Colonel So-and-so in command, " he will keep us all right ; " meaning the outposts would be so placed they would give an alarm before anyone could get into the trenches. Therefore, as Colonel Hale says, the field Officer who commands the outposts is the principal person on whom devolves the greatest part of the responsibility, although the other Officers and subordinates require to have been properly instructed how to carry out the orders of their superior.

The CHAIRMAN : I do not know anything that has given me more pleasure for a long time than hearing this lecture. The name was not mentioned, but I require very little further hint after hearing that letter to know my dear old friend who wrote it. He is an admirable man, a man of the same length of service as myself, but who, like all of us who really love our profession, is studying it as intensely to-day as at the first, and is trying to make the young gentlemen of the Army study it also. He was a man with whom I had a great deal of intercourse in former days, and I know that up to the present time, when he is in command of a very large body of troops at a very important station, he is studying the principles of his profession as much as he did when he was a young man. All I have to add to what has been so admirably laid before us by Colonel Hale, is this : that probably from the predilection of having served through two campaigns with them, and having studied their system carefully from the very bottom, I do incline more to the German system of outposts than to any other, and for the reasons which Colonel Hale so well brought before us. Their principle of outposts is formulated on simplicity, on common sense, and on thorough instruction to all ranks of Officers who have to carry it out. In a little work to which I once trusted myself on "Cavalry Organization," I made the remark that "I must honestly confess drill is "one of my passions ;" I was very fond of it, and gave my whole heart and soul to it ; but I could not conceive why men became so dreadfully nervous when they got command of a regiment or brigade, and endeavoured to impress on others that they should consider that the same principles which guided the command of a corporal's party were really those which, with larger experience and deeper thought, controlled the command of a regiment or of a brigade. It is the same with outposts. I have had a great deal of conversation on outpost duty with many people ; they seem to look upon it as a sort of bugbear, a sort of thing that no fellow can understand. It is the simplest thing in the world, if you will believe it is merely carrying out the ordinary precautions that you take in marching out to a field day, with, of course, the circumstances which add to it. There is one admirable part of the

German system which I really thought more of than any other, and that is, that such an abominable system as prevailed in former days, of what was called "mixed "outposts," is utterly unknown in the German Service. Whatever the body is which has to give outposts, it is a unit. The outposts are given by a division, a brigade, a battalion, a regiment, a company; but they are given by a unit wholly and solely, and the Officer in command of that unit is the Commanding Officer of the outposts, not an unfortunate General or Field Officer who is taken away from his own command and put to command men whom he never saw before, but a man who thoroughly knows and is trusted by those whom he is commanding. Colonel Hale said he adverted more to-day to outposts placed casually on ground that had suddenly to be occupied. The most remarkable instance of outposts on known ground I ever saw was that which was in vogue before Paris, and the one corps whose system of outposts I most carefully studied was the 5th Corps. It was simply this: half the corps was, as you may say, on forepost duty; they were before the headquarters of the two divisions respectively. Each division kept a brigade in quarters, one at Versailles, the other at Beauregard, and that brigade had perfect rest; the other brigade was on outpost duty. Of that brigade, each regiment of three battalions occupied one section of the front. Of each regiment one battalion was always on outpost duty; two battalions formed the reserve. That gave perfect rest to a very large portion of the force, first to half of the army corps, next to that part of the other half which was not actually on outpost duty; so that the proportion used on this harassing duty was about one-sixth of the whole. I am quite sure, as Colonel Hale has no observations to offer in reply to any of the remarks made to-day, you will empower me to tender him a most sincere vote of thanks for the extremely interesting lecture he has given us.

Friday, April 1, 1881.

LIEUT.-GENERAL SIR GARNET J. WOLSELEY, G.C.B., G.C.M.G.,
Quartermaster-General, in the Chair.

THE BEST MEANS OF ADAPTING THE EXISTING MILITARY FORCES TO THE REQUIREMENTS OF THE EMPIRE.

By Captain WALTER H. JAMES, late R.E.

THE time at my disposal this afternoon will only allow me to touch briefly on the various branches of the wide field which forms the subject of my lecture, and I must, therefore, ask your forgiveness if I allude but cursorily to many points which, while undoubtedly of great importance, affect only indirectly the question as I propose to treat it.

Strictly speaking, the military forces should embrace both the Navy and Army; but I feel it better to leave all considerations as to the way in which the former should be organized to those who have better right than myself to speak on the subject, and will confine myself to the land forces alone.

I propose, therefore, to commence by ascertaining, first of all, for what purposes we want an army; and, secondly, what numbers are required for these various purposes.

The British Empire requires an army—

1. To defend Great Britain and Ireland.
2. To hold India and the Colonies.
3. To take part in European wars in support of treaty rights, or which may be produced by the aggressive action of other Powers.

First of all, the defence of Great Britain and Ireland. In the case of England and Scotland we have to consider the force which would be used to invade us. Such a force would probably be about 100,000 or 150,000 men. To oppose it successfully we ought to have an army considerably superior to the invaders in point of numbers: because we have not only to meet the actual invading army, but also to guard against feints, and such an arrangement involves a certain amount of dissemination. Our field or active army should, therefore, consist of at least 200,000 men. In addition to this, we should require about 60,000 to 70,000 for the proper defence of our fortresses, such as Portsmouth, Plymouth, &c. I do not take into consideration the defence of London as an intrenched camp; for although it is highly necessary to protect this city by a ring of detached forts, it is emi-

nently improbable that it ever will be done by permanent works; and it is extremely doubtful whether, in case of war, we should have time to erect the necessary semi-permanent constructions.

To garrison Ireland in time of war, *i.e.*, to keep down rebellion and repel invasion, would take about 60,000 men. It would seem, therefore, that altogether about 320,000 are required for the defence of Great Britain and Ireland.

To hold India and the Colonies. Past experience would seem to show that about 70,000 are needed to garrison India, and 20,000 for the Colonies.

Lastly, for expeditionary purposes in Europe. To arrive at a proper understanding as to what force is required for this purpose, it is necessary to ascertain what would be required of it. Now it is extremely improbable that we should ever enter on a European war without allies, so that we should not have to provide the whole fighting force; but we must, on the other hand, not forget that the times have considerably changed since the beginning of the century. Then we were able to raise a considerable foreign force, now by the universal introduction of compulsory service we should be unable to do so. Moreover, the size of modern armies is very considerably in excess of what was formerly the case, so that we should be obliged to put a relatively larger force in the field than we did then to meet them. It is certainly within bounds to assume that at the first outset of a war, Germany would put into the field 800,000 men, and would keep her field armies up to that force at least. France would begin war with a field army of about the same strength. Russia might raise about 600,000 for a European conflict, Austria some 500,000, Italy, about 200,000. We must, therefore, be prepared to enter into the field with a force which would form an adequate reinforcement to any nation with which we might be allied, *i.e.*, we must be able to maintain a field army of 100,000 to 150,000 men. Such an army would be large enough to act independently, while experience shows that a force of that size does not suffer from numerical inferiority so severely as a smaller one does. It is an open secret, I believe, that our expeditionary army is estimated at two army corps, *i.e.*, about 60,000 fighting men. Such a force would be totally inadequate to take a respectable part in any modern European war.

There is one other point to which I must draw attention, viz., the necessity for a force of some 10,000 men, ready at all times to take the field, and available for those small colonial wars which we are constantly engaging in.

To recapitulate, then, we require for—

Home defence	320,000
India and the Colonies	90,000
Expeditionary purposes	120,000
Total	530,000

Our organization must be such as will permit this force being raised with a moderate peace establishment, and it is hardly necessary

to say that it must be done by a purely voluntary system. Whatever may be a soldier's opinion as to the desirability of universal service, its introduction lies far beyond the sphere of practical politics, and must be dismissed.

Our Army, then, must be raised by our present voluntary system and as the national spirit seems to have settled into the partite division of regular army, militia, and volunteers, including yeomanry; it would seem desirable that our military forces should embrace these sources in a proper proportion.

Let us, then, see in what way they can be applied to the requirements of the Empire.

First of all, India. Our Army there must be composed of regular troops, supplemented, as at present, by a regular native army. Into the organization of this latter force I do not propose to enter. With regard to the European portion of our Indian garrison, shall it be local or as it is at present? Now, there are undoubted advantages about a local Indian Army, but it is impossible not to see that to re-introduce it on the scale of the large number of battalions now maintained there would considerably dislocate our present organization. It would be impossible to order by a stroke of the pen that a certain number of regiments should henceforth be local Indian regiments, and if this were not done, it would involve the disbanding of a large number of our existing battalions, since the present number is far in excess of what the nation would pay for if a large proportion of them were not kept in India. It seems, therefore, pretty certain that any scheme which may be adopted must maintain the present system of a non-local army, forming an integral part of the general military organization of the Empire.

With regard to the Colonies. Three duties are required of the military forces of a colony, viz., to hold the ports and coaling stations for Imperial purposes, to resist any attempt at conquest by a foreign Power at war with the mother country, and to protect the colony against attack from native tribes within it or on its borders. The first two of these may be said to be the common duty of the Home and Colonial authorities, and the burden of the last will fall entirely on the colony when it is self-governing. It would, therefore, seem desirable that some scheme should be drawn up embracing the whole of our colonial possessions, and showing in what way the resources of Great Britain and the colonies should be combined for these various purposes. The ports and harbours required for our Navy and our commerce should be to a great extent held by regular troops in the pay of the Home Government, supplemented in time of need by local levies. But it is absolutely necessary that these local levies should be organized, officered, and equipped in a manner which would meet the approval of proper military authorities; that they should, moreover, when called out be under the same law as the regular soldier. It is much to be feared that in some of our colonies, quantity, not quality, has been obtained in the local forces; that they are not in all cases well officered or equipped, while recent reports would seem to show the desirability of such forces being under those rules and regulations which the expe-

rience of centuries has proved to be necessary for the proper government of an army in the field.

To deal with the native wars the colony would, except in the case of those too thinly peopled by the white race, employ its own forces only.

It would, therefore, seem to me that the ideal organization for a colony would be somewhat as follows:—Its harbours to be protected by fortifications at the cost of England or the colony, according to circumstances; for example, Australia can pay for them, Bermuda cannot. A force of Imperial troops should be kept there to serve as a sort of *garnison de sûreté*, and as a type on which the local forces could model themselves as far as drill and discipline were concerned. That the latter should be organized on a plan suitable for the country, and so as to fit in with the Imperial troops. That England should provide a certain number of Officers to train the local forces and for staff and instructional duties.

In my ideal colony, therefore, we should have a nucleus of Imperial troops, capable of expansion from local sources in time of war, provided with a proper staff and proper training establishments. The War Minister of the country, even if he were not a military man, might have at his right hand the Officer commanding the troops, who should also command the local levies. There would, I believe, be little difficulty in getting good Officers for the colonial troops—men who would be willing to undergo the necessary amount of training, provided they received commissions from Her Majesty. The rank and file might be volunteers or militia according to circumstances, and a portion of the forces might be permanently embodied, as is the case at the present time in Canada. All must admit that some understanding with our colonies as to the respective proportions of the Imperial and the various local government troops is necessary, and that it should be come to as soon as possible. It is to be hoped that the labours of the Commission now sitting may be so directed as to lead to this result.

In the case of those foreign possessions, such as Aden, Malta, Gibraltar, and Bermuda, &c., where there is no local population, they must be treated as fortresses to be garrisoned, as at present, by Imperial and regular troops.

And now with regard to the army required for home defence, for foreign wars in Europe, and for small expeditions for foreign wars, we must have, as I have said, a force of at least 100,000 to 150,000 men, and it must necessarily be composed of regular troops. But it must not be forgotten, that to maintain an army operating in the field, we must have troops available to guard its communications. The numbers required for this purpose would vary with the country we were operating in, and with the length of the line of communications, and cannot therefore be accurately estimated, but it would seem probable that at the outset about 10,000 men would be sufficient. We must also have some arrangement by which the troops in the field can be kept up to their full strength by properly trained reinforcements. We learned in the Crimea the urgent necessity for organization of this kind, and it is devoutly to be hoped we shall have it before we are again involved in war.

For home defence we have two different cases to meet. The one when we are suddenly threatened by an invasion when at peace; the other, when, being at war with some nation, and with our Army employed abroad, invasion has to be met. The second being the graver danger, if our organization enables us to meet it we need not consider the former. Our military system must therefore provide a sufficient force to act abroad with proper means to keep it up to strength, and at the same time some means of embodying a properly trained and sufficient force to take the place of the Army when abroad. Such a force must be mainly composed of regular troops, and if we had a due proportion of regular reserves, we might arrange that its place should be taken by them with the militia as a second line. I would propose, therefore, that when we are engaged in a European war, which necessitates our putting the whole of our regular Army in the field, that their place at home should be taken by reserve regiments to act as dépôts, and defend the country. These reserve regiments would be composed chiefly of regular, but supplemented by militia and volunteer reserves belonging to each regiment, and might vary in strength with the magnitude of the struggle. They would exist only in war time, but they would form the recognized substitute for the Army, and would always be embodied when the regular Army went abroad. With an organization such as this, supplemented by the militia and volunteers, a sufficient force would be raised to protect the kingdom.

The weak spot in our present organization is the small reserve force it creates, due to a wrong proportion between the times spent in the Army and in the reserve. Moreover, our lowest strength battalions are so weak, that tactical training is impossible, and the brigade dépôts, as at present organized, contain so few men, that instruction cannot be carried out, and they are ridiculously over-officered. For instance, except for twelve battalions which have dépôts 150 strong, no dépôt exceeds 80 men, and the majority, 47 out of 71, have only 50. But in all cases the number of Officers is the same, viz., 1 Lieutenant-Colonel, 2 Captains, and 2 Lieutenants, 5 altogether, exclusive of the Officer commanding the dépôt. This gives an average of 10 men per Officer, the result being that, as is well known, Officers at a brigade dépôt have absolutely nothing to do. Moreover, the connection between the dépôt and the regiment is at present chiefly theoretical. The mere ghost of the latter represented by the former does not bring it home to the people. Keep up a regiment in a country quarter with its men drawn from the neighbourhood, and with its regimental organization, its band, &c., to keep it before the non-military population, and you will find the bond between the soldier and the civilian grow and increase every day. At present it is unsatisfactory: thus, the numbers raised by each brigade dépôt for its line battalions varied, but on the whole, we find that in 1879 only 5,518 recruits out of 15,915, i.e., only one-third, were enlisted for the linked battalions.

Again, the system which obtains of raising the battalions gradually from the lowest to the highest strength as they approach the time for going abroad, is one that cannot be too strongly con-

demned. It ensures the presence of the maximum number of recruits in a regiment just at the time when it ought to be composed of trained soldiers. It follows, therefore, that either we must send a battalion of boys abroad or else must make up its strength by volunteers from other regiments, a most pernicious practice. It seems to me, moreover, that the proposed arrangement of our battalions is illogical. Seventy battalions abroad of 800 to 820 strong are to be fed by battalions which, with their dépôts, vary in strength from 530, 580, and 630 to 1,000. If the strong battalions are necessary to feed certain regiments, surely they are necessary for all. What really happens, however, under this system is, that the weak battalions cannot feed their links abroad, and that the necessary drafts have to be supplied from other regiments. Again, the system of relief by battalions and regiments is wrong and costly. Either the home-coming corps must give up the men who have not served their time to others that are stopping abroad, or else it must bring them home to replace them by others, many of whom must be sent back in two or three years. Regiments which are serving abroad, which have no reserves of old and seasoned men to fall back on, should be composed of men of some length of service. On the other hand, the regiments at home should serve as mere training schools through which men should be passed into the reserves, and as dépôts for the regiments abroad. We have hitherto tried to carry out these two incompatible ideas in one battalion, and have necessarily failed. I would propose, therefore, that the double battalion plan, shortly to be introduced, should be carried out to its logical conclusion. That one battalion should always be abroad and one at home. That the home battalion should embrace the present brigade dépôt, thus giving a battalion of a respectable strength, and that it should be absolutely localized, *i.e.*, given a quarter from which it should not be moved except for manœuvres or war. Such an arrangement would greatly facilitate mobilization, and every headquarters should contain the whole of the equipment necessary for this purpose. A similar organization should be introduced for all the other branches of the Service.

We must also bear in mind that our peace establishments should be the minimum possible for a proper war strength. The reserve service should, therefore, bear as large a proportion to the colour service as possible. For the infantry, judging from other nations, we might fairly compose our war battalions of half reserves, half men who are serving. But we must not forget that dépôts are needed to keep these battalions full, and that in England it would be necessary to have regular troops to take the place of the Army if it went abroad to fight. Our reserves must, therefore, be sufficiently numerous—

1. To fill up regiments to war strength;
2. To provide a second line and dépôts for the army in the field.

The organization for this purpose should be latent in peace, but so contrived as to be readily available in war. It seems to me that this might be done by keeping the necessary cadres of Officers and non-commissioned officers in existence for a 3rd or dépôt battalion, somewhat in a similar manner to the German landwehr. The number of

reservists that would be obtained by the increased length of reserve service would be sufficiently large to permit the formation of this additional battalion after the 2nd had been made up to war strength, and, when necessary, the former might be strengthened by the addition of militia and volunteer reserves. I show in Table A how this would be done for the infantry, the arrangements for the other branches of the Service being similar, the necessary force of reserve Officers to be obtained as at present, and by making every Officer who enters the Army serve fifteen years either with the colours or reserve. Reserve Officers should be told off to regiments in peace, and should, as a rule, be attached to those in which they have served, or with which they are linked in the case of those belonging to the militia and volunteers. Their names should appear in the Army List with their regiments, and the men of the reserves should rejoin their own regiments and no others. In 1878 a very large proportion of the reserves were posted to regiments other than those they had served with. The ordinary practice in the event of a European war would be to mobilize the Army first of all, the reserve battalions, cavalry regiments, batteries, &c., in the second place, and finally the militia if necessary. To meet the case of small expeditions, I would propose that 8 infantry battalions should be kept at a strength of 1,000 men, so that 8 battalions, 800 strong, might be sent abroad, leaving 8 dépôts, 200 strong, behind them. Similarly 4 batteries of artillery might be kept on a war footing ready for active service. Cavalry I propose should always be on a war footing ready for service.

I will now describe more in detail the manner in which I propose to carry out these propositions.

The Regular Army.—It is, of course, necessary to start with the assumption that this is to be raised by voluntary enlistment. I propose that we should have 71 regiments of the line of two battalions, the first of which should be always abroad. That the reliefs should be by annual drafts, the Officers going out and coming home by roster. That the foreign battalion should have a strength of 800 men. The home battalion 650 men. That the brigade dépôt should be abolished and the regiment absolutely localized, *i.e.*, the battalion at home should have a permanent quarter told off to it, and kept there. That the term of service should be twelve years—four years with the colours and eight with the reserve—for men who do not go abroad. In the latter it should be ten years and two years. No man to be allowed to go abroad under two years' service. The service abroad with the foreign battalion to be for eight years at least, and the men to be induced to go into it by bounties. The men when abroad, if medically fit, to be encouraged to re-engage to serve twenty-one years for a pension. Too much stress cannot be laid, first of all, on only sending men abroad who are physically fit, and, secondly, on allowing those whose physique can stand the foreign climate to re-engage. By proper attention to these two points the recent Report on Army Reorganization shows that drafts of 5 per cent. per battalion per annum, *i.e.*, 40 men for a battalion 800 strong, would suffice to maintain the infantry at

a proper strength. Those men who do not go abroad, but enter the reserve, to be liable for a fortnight's training every year for the first eight years of their "reserve" service, unless they join the volunteers, and keep themselves efficient and first class shots. Men in the last two years of their reserve service not to be called on for their annual training. The reserve to be permitted to volunteer to rejoin the ranks when occasion requires. If it were necessary to increase the strength of our troops abroad, as in the case of the Afghan War, I should propose that the foreign battalions should be increased in strength, say up to 1,000 men, by large drafts sent out from the home battalions, or made up from the reserves by volunteers. This would not dislocate our machinery as we do at present when we send battalions abroad, which have already their link away from England. The pay to be arranged on a totally different principle. The ordinary working man is used to weekly wages. He should be paid on the same principle in the Army. I would propose that the soldier should be fed properly, clothed and housed at the expense of the country, and allowed a certain sum per week in addition. I believe that, adopting this plan, a man might be paid about 4s. a week as pocket-money. This sum should be continued in the reserve in this way, 3s. per week monthly in arrear, and 1*l.* at the end of each training.

The changes which are about to be introduced in the pay and position of non-commissioned officers seem to me judicious. But I think that for them, too, the pay should be estimated by the week. Moreover, I believe that we do not put the pay question fairly before the men. A man on enlisting is told that his pay is so much, but he finds immediately that he is liable to all sorts of stoppages, and that the sum which he is told he ought to receive is swallowed up in a hundred different ways. I should prefer to manage the messing, washing, and clothing of the men as a regimental affair, which can easily be done with local regiments. Then the sum which is now deducted from the individual soldier's pay for the first two items would be credited directly to the regimental fund, and managed by a regimental committee. I would also allow the soldier the average amount spent annually in keeping up his kit. In short, as I have said, the soldier should be clothed, fed, housed, and doctored at the expense of Government, and receive pocket-money in addition. Accounts would be simplified, and one great source of discontent removed. As to the clothing, it would be infinitely better managed by the regiment. A central department might supply the materials, but they should be made up in the regiment. The gigantic centralization of our clothing department is a mistake; it would fail to supply the Army in war, as it failed in the mobilization of 1878. By making up the things locally and regimentally, better fits would be ensured, economy would be obtained, and, what is best of all, we should know that on mobilization we had efficient machinery for the supply of the necessary articles.

With regard to the cavalry, it may be well to point out that we are the only nation which does not keep its cavalry constantly on a war

footing. Experience has shown that it does not do to suddenly augment regiments with untrained horses. It seems to me, therefore, that we should accept this fact and keep our cavalry always on a war strength. As it takes longer to make an efficient cavalry man, and as, being always on full strength, reserves are not wanted so much as in the infantry, I would propose that the cavalry should serve eight years in the ranks and four in the reserve. In time of war these reserves would be formed into reserve regiments, to act as dépôts, or, if necessary, might be sent into the field.

Foreign service for the cavalry to be provided for as follows:— There are 31 regiments altogether, of which 9 are in India, leaving 22 at home. Of the 31 regiments, 13 are hussars and 5 lancers. I would propose to arrange these as 12 hussars and 6 lancers, doubling them up as in the infantry into 6 regiments and 3 regiments respectively, keeping one half abroad, the other half at home, and relieving the rank and file by drafts composed of men of over two years' service, who would volunteer to serve eight years in India under the same conditions as the infantry soldier. The thirteen single regiments would do no foreign service except in case of emergency, but, being always at war strength, could be sent abroad at a moment's notice.

So far as the artillery is concerned, it seems that we might again imitate the example of foreign nations and keep only four guns and a certain proportion of wagons, &c., horsed in peace time. This would enable us to keep about eighty batteries at home on foot, instead of fifty-three. Our garrison artillery might be kept at about its present strength, being made up when necessary by militia and volunteers. Service in the artillery to be for six years with the colours and six in the reserve. The garrison and field artilleries to be separated, and the regiment divided into three regiments, each of these to have a field and garrison division. As with the cavalry and infantry, so with the artillery, reserve batteries would be formed out of the reservists on mobilization to act as dépôts or to take the field if necessary. The foreign service would be managed, as in the infantry, by roster for the Officers, by drafts for the men, cadres being kept always abroad.

The organization of the engineers should be constructed on the same lines as the rest of the Service. I would divide the corps up into three battalions of six companies, so far as the men were concerned, and conduct the reliefs exactly on the same principle as the infantry. Similarly the reserve men would form reserve companies on mobilization. With regard to those administrative branches of the Army which may be classed under the head of "train," they are portions which are required in small numbers in peace, but very large numbers in war. I would therefore propose that the service of the men should be three years in the ranks and nine in the reserve; this would give a large force of properly trained men for the multifarious duties required of this branch of the Service in time of war.

I have now to refer to the Auxiliary Forces.

The militia should be united with the line, forming the 4th and 5th Battalions. The Officers, up to the rank of Captain inclusive, should be liable to serve in time of national emergency with the line or reserve

battalion. The men to be enlisted as at present, but to be available for foreign service in Europe. The men of the militia reserve to be supernumerary to the extent of half their number. I believe it would also be well to induce them to train for a couple of months with their linked battalion. The militia recruits to be trained with the line battalion immediately they enlist. At present a very large number of men take the bounty and never join the Service. Steps must also be taken to make the Officers efficient. All should be compelled to pass through an instructional school, and no one should attain field rank until he has served six months with a regular regiment, and passed an appropriate examination to show that he is fit for the position he aspires to. An Officer, on joining, should serve two months with the line battalion.

The volunteers should be intimately associated with, and form part of, the line and militia regiments. They should wear the same uniform, with some slight variation. The men should undertake to serve for a given period, say two or three years. As a practical fact, in most volunteer corps there is a regimental rule to this effect. All the Officers should be made to pass through a school of instruction, and Inspecting Officers should see that they keep up their knowledge. The different corps should be encouraged to take part in autumn manœuvres. Volunteers should be allowed to join the army reserve under certain conditions. They should be marksmen, have served two years as "efficients," come up to the proper physical standard, and be not less than twenty years of age. It might be necessary to limit the numbers, but by such means as these a very valuable auxiliary reserve might be obtained.

Both varieties of Auxiliary Forces should, I think, be clothed and equipped from the local establishments I have suggested.

So far as the yeomanry are concerned it would seem to me desirable to attach the various corps to regular regiments, on the same principle as the militia and volunteer battalions. It is, however, by no means so essential a part of organization as the former is.

The object sought to be gained by the suggestions I have made is to popularize the Army, and to bring it home to all classes of the nation. By localizing and associating regulars, militia, and volunteers in one regiment, this will be done. It is the volunteer force that has spread military tastes throughout the country, and we have only to foster and direct those tastes to render the British Army a vastly more efficient force than it is at present. By strict localization the inhabitants of each district will feel that the regiment is a part of themselves. There will be less difficulty in getting men for the foreign battalion when those who go to it know they will find in it their own friends and former comrades. By drawing together the bonds between the regulars, the militia, and the volunteers, recruiting will be facilitated, and the supply of men to fill the ranks during war will be rendered far easier. The militiaman or volunteer will join "our battalion" fighting abroad, when it numbers in its ranks his own relations and friends; but the same man would not dream of going to a regiment with which he had no connection whatever. This feeling of

clanship it was which made the old Highland regiments what they were ; and this feeling will again, if properly fostered, make regiments which are not mere bands of soldiers but military families.

There are only two arguments against localization which deserve notice, the one that men would marry, the other that they would form too much a part of the civilian population. The latter is now-a-days of no weight. The former can be met by not allowing the men who serve so short a time to marry. On the other hand, must be remembered the saving of the large sum spent every year in moving the regiments from quarter to quarter. Another advantage of the scheme I have sketched is the saving from the fact that every man who goes abroad does so for eight years. At present a man may go to India one year, and be brought back again to join the reserve after two years' service.

I may also point out the advantage of some definite scheme of Army organization. At present our Army forms an agglomeration of battalions, batteries, and squadrons. It is the only army in the world which has no higher unit. By casting it into brigades and divisions mobilization is facilitated. Generals and Staff Officers learn to know in peace the troops they will have to deal with in war ; no mean advantage, and one which we have too long neglected. Our Army might be organized into eight divisions of nine battalions infantry, exclusive of the Guards. The twenty-two regiments of cavalry at home to be divided thus :—Three Guard regiments to the Guard division, eight regiments to be told off as divisional cavalry, the remaining eleven into four brigades, one of two, three of three regiments, these latter being the double regiments which furnish the foreign reliefs. The artillery, engineers, and train to be similarly divided. It would perhaps be better to go farther, and to divide the United Kingdom into army corps districts which might to a great extent be independent of the head office. Within these districts the Officer commanding the corps should be supreme. Assisted by his staff he would make the arrangements for the instruction of reserves and auxiliary forces, would work out the mobilization plans, arrange for the necessary drafts for the foreign portions of his corps, &c. To fully describe how this system should be carried out would, however, take more time than is available. It is, moreover, so bound up with the larger subject of the general reform of our Army administration, that the one could not be adequately dealt with without the other.

It may be well to explain why I have placed the war strength of a battalion at 1,200 men. I have done so first of all because 650 is about the largest number of men that we can expect to be allowed for a battalion in peace time, and that number may be raised to 1,200 on war strength without introducing too large a proportion of reserves. Secondly, because while thinking the authorized strength of the British company—125 men—to be a good one, I think it none too large. Experience shows that even before the first actions regiments suffer loss, and it is not too much to assume that if we start with a nominal strength of 1,200 men we shall not have many more than 1,000 when collision takes place.

As to the cost of the scheme. It is always difficult to compare

proposed with existing schemes, as there are always unforeseen points which will affect the calculations with regard to the former. But I do not see any particular reason to believe that my scheme will be more costly than that which exists at present. The points of saving on my proposals are :—

Saving of pay of one Lieutenant-Colonel per regiment;

Saving of cost of annual moves;

Saving of cost of transport of troops abroad and home.

There are other points on which I believe saving would be effected, but which do not easily admit of calculation. On the other side must be put the extra cost of maintaining a larger number of horses for the cavalry, and difference of pay between two Subalterns as opposed to one Captain; in other respects my numbers do not exceed those contained in the General Annual Return of the British Army for the year 1879, and would be maintained by the same expenditure. My proposals as to pay of the men and the increased numbers of the reserve will, of course, involve some expense; but I believe this will not be excessive, and at any rate it will give a *quid pro quo*. With regard to barracks some expense would most likely be incurred, but in a great measure the existing accommodation would suffice.

I have thus briefly sketched the method in which, I believe, our military forces should be organized to meet the varied requirements of our Empire. I have necessarily been obliged to deal somewhat generally with the subject; but to have treated it in detail would require, not one, but twenty hours; and I will, therefore, ask your pardon if I have omitted much that is of importance. It seems to me, however, that we have lived in our chaotic state long enough, and that the time has long come when we may sit down and ask ourselves, what do we want our troops for, how many do we want, and how shall we raise them? Let us only put these questions fairly, and surely we may hope to get something like a definite answer. We have hitherto lived from hand to mouth in our military affairs, let us now try to provide ourselves with a system. We must not, however, forget one thing. Our man-producing machinery may be all that we require, but unless we supplement it by a proper system of training, its working can give us no commensurate results. Autumn manoeuvres seem to be quite forgotten. It is but a few years ago that an elaborate plan was announced by which we were one year to have a large force mobilized for this purpose, the next year a force was to land at some point on our coast, thus practising embarking and disembarking; the third year a portion of our troops were to be trained at some tactical place, such as Aldershot. I need hardly remind you that this programme has never been carried out. We seem to act on the principle that our men require no training, that they know intuitively what others must be taught. Neither in the company, squadron, battery, nor regiment do we instruct them as they should be instructed. No one who is acquainted with foreign armies, especially the Austrian, French, and German, can for a moment doubt that, whether we should copy them in all points or not, they possess one feature at least which we might with advantage imitate, viz., the earnestness of purpose

with which they strive to teach practically in peace what they have to do in war.

A.

Table showing Organization of an Infantry Regiment.

1 Colonel commanding, 1 Regimental Adjutant (a Captain).

1st battalion. Abroad.	2nd battalion. At home.	3rd battalion. Reserve.	4th and 5th battalions. Militia.	6th, &c., battalions. Volunteers.
800	650	To be formed in case of war from supernumerary reservists, supplemented if necessary by militia reservists, and volunteer reservists. Officer cadre to be formed from retired Officers and other qualified individuals. This cadre to be put in the Army List with the regiment.		

Table showing composition of 1st, 2nd, and 3rd Battalions in Peace and War Time.

	Peace.					War.				
	1st battalion.	2nd battalion.	Regimental Staff.	Total.	Mr. Childers' scheme.	1st battalion.	2nd battalion.	Addition to peace strength.	Regimental Staff.	3rd battalion.
Lt.-Colonels..	1	1	1	3	5				1	1 ¹
Majors.....	4	4	..	8	8			..	4 ¹	
Captains....	5	5	1	11	12			..	1	5 ¹
Lieutenants ..	16	16	..	32	30		2 ¹	8 ¹	..	16 ¹
Men	800	650	..	54	55	..	1,200			

¹ From reserve of Officers.

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B.

Organization of Army.

8 divisions and 1 division of Guards.

1 division :—

9 infantry regiments.

1 cavalry regiment.

8 { horse artillery batteries (2 divisions, 10 batteries).

 } field batteries.

2 engineer companies, including pontoon train, &c.

Train.

Guard division :—

7 battalions Guards.

3 regiments Guards cavalry.

1 battery horse artillery.

7 field batteries.

2 engineer companies.

Train.

Four independent cavalry brigades, one of 2, three of 3 regiments, and each with a battery of horse artillery.

C.

Peace Strength of the Army at Home.

Infantry.

63 battalions of 650 men.....	40,950
8 , , 1,000 ,	8,000
7 , , Guards of 650 men	4,550
<hr/>	
	53,500

Cavalry.

22 regiments of 549 men and 500 horses .. 12,078 men, 11,000 horses.

Artillery.

	Guns.	Men.	Horses.
76 batteries of 4 guns, 120 men, and 78 horses..	304	9,120	5,928
4 batteries on war strength.....	24	600	440

Engineers.

18 companies of 120 men 2,160 men, 540 horses.

Train.

18 companies of ? men..... ? men, ? horses.

D.

*War Strength of Army.**Infantry.*

71 2nd battalions of 1,200 men	85,200
71 3rd or reserve battalions of 800 men.....	56,800
142 4th and 5th militia battalions of 800 men	113,600
Volunteer battalions, say	174,400

	430,000
Add for Guards { 7 battalions of 1,200 men.....	14,000
{ 7 reserve battalions of 800 men }	_____
	444,000

Cavalry.

22 regiments of 500 horses.....	11,000
11 reserve regiments of 500 horses.....	5,500
Yeomanry, say.....	14,000

	30,500

Artillery.

80 batteries of 6 guns.....	12,000 men, 480 guns.
80 reserve batteries of 6 guns	12,000 " 480 "
Regular, militia, and volunteer garrison artillery.	

Engineers.

18 companies in 3 battalions of 6 companies.....	3,600
18 reserve companies.....	3,600
Militia and volunteers.	

Train.

3 battalions of 6 companies of 200 men.....	3,600
3 reserve battalions of 8 companies of 200 men	4,800
Reserve battalions as necessary.	_____

8,400

The CHAIRMAN : We shall be glad to hear gentlemen who may have any remarks to make upon this interesting paper. I think I may congratulate the meeting on the presence here of Lord Waveney, who, as we all know, has given great attention to this subject.

Lord WAVENY : It would be absurd affectation on my part if, after the observations of your Chairman, I were to refrain from saying a few words. I have no doubt given the matter a good deal of consideration, and I have this signal advantage, that I have seen the system emerge from the chaotic state in which, as my gallant friend the lecturer has remarked, it remained for so many years. That chaotic state lasted some thirty years, and it may be said to have first been brought before the notice of the country when the Duke of Wellington, great soldier as he was, spoke in accents of distrust of the power of our troops to repel the attack of a

French army on London. Since that time we have advanced far, and I am happy to acknowledge the chaotic state is so far a thing of the past that many of us can hardly remember it. Things improved by degrees, and in May, 1852, the first camp formed in England since 1813 was established on the common at Chobham. I remember on that occasion that the regimental system was very excellently carried out, and the troops marching on Chobham took up their ground exceedingly well, in fact, the only fault was that there was too much of mere book knowledge, and of course too little of the actual science and practice of war. From point to point we proceeded, and we have no doubt arrived at a moment when our lecturer has appropriately directed our attention to a point of the very greatest importance, if not to the very existence of England, at any rate to the military and political supremacy of the Empire throughout the world. With regard to the British Service, it has this peculiarity, as has been observed again and again, and has been specially remarked in papers on army organization, that a very considerable demand on our military power is based on the need of preparation for small wars. These wars are reproducing themselves on every occasion. Last evening I was present at the debate on the war in the Transvaal, and I have been present at the discussion of three or four Kafir wars in the Lower House of Parliament, and I am afraid we are not likely to be quit of these wars for some time. With regard to the duties which fall upon us as compared with other countries, of course it is a comparatively easy thing for great Empires like Prussia and Austria, who only fight a great war once in a quarter of a century, and whose men are always in their own divisions and departments. It is, however, a very different thing when we come to the three great fighting armies of the world—the Russian, the French, and the British. The Russians especially, like ourselves, are always prepared for war. The French, I believe, thoroughly see the necessity for the same preparation in respect of their African possessions, and therefore it is that we require a system more applicable at a moment's notice than is required by the other Great Powers, and our system must be elastic in proportion to the enemy with whom we have to deal. I was very much struck on reading in a recent paper of the Royal Artillery Institute the reports of three young Officers in the Royal Artillery. One was a report of an expedition against the Naga tribe in India; the second was an account of the march of an elephant battery from Mooltan to Candahar; and the third was the report of another march in Africa. Those young Officers were in command of their respective expeditions, with the honour of England resting upon their individual efforts in a country to which the soldiers they led were not accustomed, and yet, as is evident from the internal evidence of these papers, they understood their duties thoroughly and did their work well. Service of that kind not only requires considerable preparation but also military instincts, and those military instincts are never wanting in England, when fair play is given them. The behaviour of many a young Officer in the presence of great bodies of rebels in the Indian Mutiny will illustrate this. With regard to supplying our strength for foreign expeditions and home defence, there is one point that has not yet attracted attention, and that is this: if we come to a great stress of war, whether it be for European service or *quasi* European service, as in the case of East Europe, at Sebastopol, you will find a resource, believe me, of no ordinary, —I may say of extraordinary—amount, in the militia regiments. I speak thus of my own knowledge, that the authorities at Woolwich would have hailed with satisfaction the presence of the artillery regiments of militia before the lines of Sebastopol, because in them they had the material of soldiers who would have met difficulty, sickness, and famine from the training they had received. They were of the best class of soldiers for the field; they were men from 19 to 23 or 24 years of age, who had been drilled for three or four years, and in the interval had passed their time in the occupation of country or maritime life; and I may say of those whom I had the honour to command that a very large proportion of them were men who spent one-half of the year in rough lodgings or at sea, were thoroughly inured to exposure, and able to go anywhere. But let me say this—do not break up regiments, do not interfere with the militia system; if the men are well officered they will go anywhere, they will not volunteer into other regiments, but they will go with their own Officers. With regard to preparation for European service we have various ports of embarkation—Harwich, Portsmouth and Plymouth, Cork and Limerick. Now,

for any expedition at sea it would be well to determine the regiments on each of those points in succession, and in preparation for the *corps d'armée* which should be taken abroad. I believe that real serious work would very soon teach the least-formed soldier what his duty is, and indeed I may refer to the practice of the Italian infantry. The Italian infantry are for twelve years in the first class, two years and eight months with the colours, and the rest of the time with the reserve; but during those two years and eight months continuously, they do not leave the colours. They are thoroughly trained, and the knowledge they gain of their work is very great. And now, at the risk of perhaps speaking of the Service to which I belong rather more prominently than I ought, I will say according to the training which militia regiments get in the ordinary way of two months of preliminary drill during the first year, and a third month for brigade drill, it is a very slow militia regiment indeed that cannot come on to parade on the day of assembly at 9 o'clock, have accoutrements given out, hair cut, arms ready, do a day's march, and hang up their packs in camp at 5 o'clock in the afternoon.

Captain LUMLEY, late 13th Prussian Uhlans: I shall commence what I am about to say by a few words of apology. It may be that my observations will not all come from an English point of view, but they will come from the heart of an Englishman. By a quibble of age I was prevented from serving my own country, and took foreign service, which enables me to give you my ideas on an English subject as viewed by foreigners. I first had the pleasure of making the acquaintance of our lecturer when he was learning our ideas abroad, and I have since had the benefit of his assistance in this country. He began by alluding to India. Now I am certain that the most important point in regard to the defence of the British Empire is ensuring the protection of that country. There is not the slightest doubt that within a short period England will have to defend her Indian Empire by force of arms. Russian Officers have told me on many occasions that the object of their advance in Central Asia is India, of which they make no secret. I maintain, therefore, that England should be prepared at any moment to place a competent army in the field to oppose a Russian advance on India. I will not touch upon the question of Candahar, but there is no doubt the nearer you are to your base the more likely you are to annihilate your opponent, especially if he has a long line of communication to keep up. Captain James says that for the home defence of England it is necessary to have a regular army with a large proportion of regular soldiers. From the experience that I have gained not only in European wars, but also in one in Africa, I am of opinion that the Volunteer force of England, together with the Militia, is quite competent to resist any invasion. I will not forget to mention in the first instance that, with the help of the Navy, an invasion of England I believe to be a myth, and a thing we need not trouble our heads about. Therefore in all our military reorganizations I think we should look to the defence of our colonies and of India, and leave the matter of home defence alone, for I am sure that British hearts will defend England of their own accord. Allusion was made to the colonial forces that they were badly commanded, and so on. It is very true, but the responsibility lies greatly with the Officers who held the superior commands at the outbreak of the war. Great power was given them, but they would not take the responsibility themselves, but shifted it on to the individuals who raised the irregular corps, and allowed them to nominate men who did not know how to command and had never been soldiers, while on the spot there were many English Officers who had come out to seek service, but because they did not know the people raising the corps they did not get employment, while inefficient men were put into the places in their stead. This would have been avoided if a little more trouble had been taken. A remark was made with respect to an expeditionary force in Europe, but I will pass it over, for I do not think that such an expedition is at all likely to take place. With regard to the cavalry, Captain James inferred that there should be cavalry reserve regiments formed; this is a most difficult thing to do properly, and I agree with him that cavalry regiments should always be maintained on a war footing, because you cannot make cavalry soldiers in one, two, or three years. Perhaps three years may be the limit. With regard to cavalry reserve men you may always find good employment for them. The Transport, Commissariat, and ambulances require men that have served in the cavalry. In Prussia

the men who have served their time in the Army with cavalry regiments are employed in those duties. When war is declared the wagons, &c., which are always ready, are horsed, and they are called in to act as drivers and conductors. There are one or two points I wish to add on my own behalf. I maintain that if you wish to have an efficient army, its reorganization must be complete, and if necessary it must be entirely rebuilt with the good material now so inefficiently put together. For this purpose these are the points which must have the consideration of those who have to do it ; 1. A proper distribution, organization, and localization of the forces ; 2. How to increase the numerical strength of the Army with as little expense as possible ; 3. How to raise the efficiency as well as the social status of the soldier ; 4. How to obtain good non-commissioned officers, and provide for their ultimate welfare ; 5. To raise the efficiency of the Officers by allotting to them the proper duties of their calling ; 6. To better their pecuniary position, and to regulate their promotion. It would take me a long time to go minutely into these six points ; I will, therefore, touch on them very slightly so as to give you an idea of my opinion. As to the first point, by distribution of forces I mean, in the first place, you should not have a jumbled-up army without properly organized divisions and brigades. You should have your divisions, your staff, as well as your brigades, always ready, so that you are in a position to send them away in a body when necessary. I saw this difficulty out in Zululand, and I have seen it before. Nothing is so injurious to a force as getting a lot of Staff Officers together who do not know one another. How is it possible for them to act together under such circumstances ? It is very much like putting four horses in a team who have never been driven together, and expecting them to go properly. As to localization, I must say that in localization lies the future strength of the Army, because by localization you will improve the status of the soldier. Until now the soldier has been an outcast : he has been looked upon by the British public as a man they did not like to approach ; but if he joins the regiment of his own county he will be known there, which will induce him to behave properly, and he will consequently gain respect, and a better class of recruits will be obtained. Then women will not be ashamed to be seen with a soldier ; but, on the contrary, they will feel a pride in their acquaintance. The women of Germany are afraid of being seen with a man who has not been a soldier, because they say he must be good for nothing, for a man who has been convicted cannot enter the army. No doubt the double-battalion system is the only one which will be effective. There ought to be two battalions attached to these double-battalion regiments, a reserve battalion, and the militia, the militia formed upon the principle upon which it is formed at present, so that the sons of county gentlemen not adopting the Army as a profession, and the Officers who have served in the county regiment after their term of active service is completed, should officer the militia and reserve battalions of the regiment they originally joined. If you do that you will localize your army, and there will be a better *esprit de corps*, the Officers and men living with one another to make their county regiment the best in the kingdom. There is but one way to increase the numerical strength of the Army as economically as possible. The lesson was taught the Prussians by Napoleon, after the Treaty of Tilsit, "short service," by which means alone you can obtain a strong reserve. I maintain that a soldier can be made a competent infantry soldier in three years if properly drilled and taught. But, on the other hand, we must consider India, and the expense of moving troops backwards and forwards, and therefore what the lecturer has said as to offering inducements to the men to join for service in India for a lengthened period is certainly the right thing to be done. Some people say short service has given us boys. Why has it given boys ? Because the recruiting sergeants have enlisted men who were not men, and consequently this objection is to be attributed to the way the system has been carried out, and not to the system itself. As I have already said, improvement in the social status of the soldier is only to be attained by localization, by bringing him to his home, and by looking upon him as one of the people. Captain James said there were two reasons against this : one that the men would marry, and the other that the men would form part of the nation. Let them marry if they like—you need not recognize the wives of those who marry without leave ; as to the second objection, I am of the opinion that the soldier should form part of the

people. With regard to obtaining good non-commissioned officers, that is to be done by future inducements. There are in England many county as well as public institutions which will provide amply for worthy men who have served a certain period. Those positions should vary, and the pay should be varied according to the length of service of that non-commissioned officer. If he leaves after eleven, fourteen, or eighteen years, he should have a corresponding position given to him. This will be an economy to the nation, and it will give an inducement to the men to stay. After twenty-five years they should be allowed not only to draw their pensions but to receive appropriate employment besides. As to raising the efficiency of the Officers, that is a difficult subject to touch upon, especially placed as I am; but in my opinion the English Officers are not at present employed exactly as they should be. I believe the material of the English Officer is as good as any in the world, but his instruction and training does not conduce to efficiency. He is not taught to teach his men, consequently the men do not look up to him for instruction and example; they look more to the sergeants than they do to the Officers. What should be done is this: the English Officers should do the work that is now done by the non-commissioned officers, and the non-commissioned officers the inspection work which is done by the Officers. The Army should be looked upon not as a pastime, not for persons to go into and amuse themselves, but it should be looked upon as a profession upon which depends the existence of the Officer and that of his family after him; for this purpose inducements should be held out to the Officers so as to make it worth their while to devote their whole life to their profession. These tables will show you how much money is wasted. Here you have 27 Officers to 800 men, nominally a tremendous proportion. In Germany there are to a battalion 1,000 strong, 1 Lieutenant-Colonel, 4 Captains, 13 Lieutenants (4 1st and 9 2nd Lieutenants), including the battalion Adjutant. What you want is to make the company the unit, to give the Captain greater responsibility, to make him solely answerable for the efficiency as well as interior economy of his company. By having 1 Lieutenant-Colonel, 4 Majors commanding companies, 4 Captains corresponding to the 1st Lieutenants in Germany and 9 Lieutenants, a great saving in money would result, and promotion would be facilitated. I propose that the money saved in this manner should be divided proportionately among the Officers, thus improving the pecuniary portion. The bane of the English Service is the Adjutant. Why? Because he is himself in a false position, and puts Officers in the same. Moreover, the Colonels are apt to look to him and the non-commissioned officers alone for the efficiency of their regiments. In the Prussian Service the Captain is answerable by his commission to the Emperor for the efficiency and drill of his company or squadron. If that were done in England you could do away with the Adjutant as he now is, and he would become what he is in Germany and in Austria, the writer and private secretary of the Colonel, which is his right position. I hope you will accept what I have said in the spirit in which it has been said.

Colonel BLUNDELL: It appears to me that reserve men should certainly be liable to serve in any little war in which the brigade to which they belonged is engaged, nor can I see the object of giving a reserve man 6d. a day unless that is the case. Great wars only occur once in about fifty years, and twenty-five years elapsed between the Crimean War and the first time our reserves could have been called out. Our reserve is very small as compared with the requirements of the country. If it ever reaches 60,000 men, it will not even raise all the regiments to a war strength, so that to call it a reserve is a misnomer.¹ No one, however, who has seen it can doubt its extreme value; but really the reserve men should be regarded merely as men on long furlough. If reserve men were liable to serve with their former brigade in little wars there is no reason to fear that it would prevent men enlisting, and therefore why not make them liable for such service? The next point that occurs to me is as to the Army Reserve men. We have constantly cases of men in the Army Reserve who try to re-enlist, and do so successfully. They re-enlist and re-enlist again, and are what is called "relegated" to the reserve after com-

¹ The population of the United Kingdom is as large as that of the United States was at the time of their civil war. The history of that war illustrates the point urged.

pling long periods of imprisonment at the public cost. Their excuse is they cannot get work. It would be a great advantage apparently that these men should be allowed to re-enlist for general service, and should be sent to India. The objection appears to be the idea that they would establish a claim to pension if their re-enlisting was permitted; but that might be met if their former service were allowed to count only in the case of their being invalided "in and by" the Service, or their being wounded. The next point I wish to urge is, that a battalion of 480 men is reduced below the strength at which it can possibly be efficient—I mean to say efficient even for the purposes of instruction. Many of the men probably are recruits.¹ There are men detached and employed in various ways, bandsmen and so on, and really the number left is quite insufficient. What I would urge is that men seventeen years old ought to be allowed to be engaged at a lower rate of pay, and posted to battalions last for foreign service; they might receive the sort of pay that soldiers formerly used to get until they can be called able-bodied. I think every one will agree that it would be advantageous if the weakest battalions were not reduced below 550 or 600 men; but the question, I presume, is one of expense. What economy could be made? I think one of the militia battalions at a brigade dépôt should be the dépôt itself. It should be commanded by an Army Officer belonging to one of the regiments of the sub-district. In that way a considerable saving would be effected, and I think also one corps of musicians² ought to perform the duties of bandsmen and drummers for a battalion. By reducing our battalions to 480 men, we really destroy their efficiency, because in our position we cannot measure our little wars. We might have two little wars on hand at once, and then we should require to raise these battalions to full strength. This country cannot afford to give up taking men at seventeen. They are the best men you can get if you can afford to keep them for a couple of years. General Bulwer's should be a trammel-net to take all kinds.

Colonel Sir LUMLEY GRAHAM, Bart.: There is only one branch of the subject on which I wish to make one or two remarks in allusion to what Captain Lumley has so ably stated about the training of the soldier and the Officer, and also in allusion to what Colonel Blundell has said. Colonel Blundell states that our infantry battalions on the reduced establishment are 480 rank and file, and are too small for efficient training. The Prussian battalions, which we allow to be very efficient indeed, are all on their peace establishment, I think, 444 rank and file.³

¹ In estimating the minimum establishment necessary for a battalion, the large deductions to be anticipated from that establishment are to be considered. There are men at musketry, at gymnastics, undergoing courses of signalling, non-commissioned officers at Chatham, Hythe, &c., men employed as school assistants, at the canteen and refreshment bar, shoemakers, tailors, servants, bâtmens, not only for the battalion but frequently for the dépôt and militia regiments attached to it; non-commissioned officers are often required for militia as cooks and drill instructors. During a little war volunteers are often called for for the Army Service Corps and Army Hospital Corps, and at the same time soldiers are called for to replace the men of those departments temporarily. The percentage of recruits is greater than formerly, as many purchase their discharge within the three months. A commanding Officer with his battalion so pulled to pieces may then receive an order to call for volunteers for some brigade which has a battalion in the field. The probability is that battalions in the Prussian Service on a small establishment are not liable to be depleted in this way, and that a mere comparison of establishment as between an English and Prussian battalion is delusive. It is contended that the British Army, as a whole, would be stronger if the minimum establishment of a battalion were increased to 600, even if it involved the reduction of the war establishment fixed for a battalion in the 1st Army Corps.

² The power of purchasing his discharge by a bandsman when instructed at the public expense embarrasses a battalion and requires modification.

³ The peace establishment of a Prussian line battalion is 18 Officers, 54 non-commissioned officers, and 460 privates (including 16 musicians). There are thus 444 privates exclusive of musicians.

The CHAIRMAN : It is nearer 400, I believe.

Sir LUMLEY GRAHAM : That will only make my argument the stronger, for those battalions carry on their training most efficiently. There is no soldier in the world better trained than the Prussian soldier. Why is that? Because they have the most perfect company instruction. How is it they can get this perfect company instruction? We with our battalions of 480 men cannot get any company instruction, and that is the chief reason why our men are trained so much worse now than they used to be. I am not an eye-witness of it now, having left the Service; but I hear it stated on all sides that the training of the British infantry soldier is not what it used to be. Why is that? Because there is no company instruction whatever. Why is that? Because the battalions 480 strong are divided into eight companies of 60 rank and file per company. Every one knows that with casualties and all the various duties that have to be performed and so forth, a Captain can get very seldom enough men together to represent even a section on parade. How can he instruct these men, how can he instruct himself, and how can he instruct his subalterns? I was reading the other day a very interesting account about the training of the Prussian Army, and I found that a Captain in a Prussian infantry regiment can, as a rule, depend on having ninety men on parade, and with ninety men you can teach and learn a good deal; therefore what I want to state is that you can very well have small battalions, and have them efficient if you have large companies. To have large companies you must divide the battalion into fewer companies; therefore for the sake of effective instruction, as well as for many other reasons, I think the proper organization of a British battalion should be in four companies on the Prussian system.

Colonel NORBURY : Although I have been a member of this Institution for twenty-five years, this is the first lecture I have had the pleasure of attending; and I wish to state that I have received very great pleasure and instruction from so doing. All I will do now is to take exception to one column in Table A—the third or reserve battalion, which I see is suggested to be formed in case of war partly from the reserves of the militia and volunteers, to be officered from the reserve of Officers. I must say, for my part, I think it would be more practicable to form your third or your reserve battalion by embodying the first battalion of the militia, which is really the third battalion of the line regiment, or will be, I suppose, very shortly. I cannot help thinking that the reserve battalion, as suggested in that column, would be rather a scratch lot, composed of a great number of men, no doubt individually very good, and officered by an entirely strange body of Officers. I have the honour of commanding, I believe, the strongest militia regiment in England (the Worcestershire) with two battalions; and I cannot help thinking it would be more practical that, in the event of the second line battalion being called upon to take service, the first thing to be done would be to embody the first militia battalion of that brigade; and it would be far more serviceable and reliable, especially when we remember what good service the militia battalions rendered to this country both in the Crimean War and the Indian Mutiny, instead of calling out the proposed third or reserve battalion, simply to embody one or both of the militia battalions of the district. Lord Waveney has spoken of the character of the men who formed the militia force of this country, and I must bear testimony to the greatly increased efficiency of late years of the Officers, and particularly the junior Officers, of the militia. I served some years in the line myself, in the cavalry, and I have no hesitation in saying that the standard of efficiency required from Officers of militia in these days at least equals that which was required from Officers of the line in the days when I was in the line myself. I do not mean to say the same progress has not been made in the line. No doubt a higher standard is required in the line; but I maintain that the examinations that the militia Officers are subjected to, the degree of efficiency expected from them at the general inspection, and so forth, is such that a militia Officer of the present day is certainly required to know as much as a line Officer did when I joined the Service thirty years ago. With regard to what Captain Lumley stated, I entirely agree with the expression he made use of, that a great deal too much is left to the Adjutant; but that evil is very much mitigated in the regiment to which I belong. We have two battalions with one Adjutant, and in consequence of the very great amount of office work which is thrown upon

him during training, the company Officers have to do very much what Captain Lumley has described, namely, to drill and train their own companies. The militia sergeants are, no doubt, good, trustworthy men ; and they can do their work on guard, and so on, but they cannot drill their men. The duty, therefore, falls upon the company Officers of taking a very great share in the instruction of individual companies. There are only nominally two staff-sergeants to a company. Many of these are away on other duties, and consequently the question of drill and instruction left to a great extent in the hands of the Captain and subalterns. I am sure that no Officers in the Service work harder than militia Officers. They all attend two parades a day, and drill and instruct their own companies to a very great extent, and to that I very much attribute their greatly increased efficiency.

General HERBERT : I entirely concur with Sir Lumley Graham in what he said about the advantage of having four companies instead of eight. I have had a good deal of experience in the instruction of young Officers and in the instruction of regiments ; and when I was in command in Ireland I found that it was totally impossible to have a company sufficiently strong off duty on parade for instruction by the Officer in command. The Officers complained to me constantly that they had to attend parades when there were no men of their companies : the men were on guard, on fatigue, or employed in a variety of ways, leaving perhaps from 40 to 80 men in the whole regiment for parade. No doubt, the organization in the Appendix N, submitted to the Royal Commission of which Lord Penzance was President, states there are to be four Majors, but those four Majors are not to be dummies, as in the scheme proposed by the Secretary of State for War, going on parade to do nothing : but there were to be four Officers, each in actual command of one-fourth of the battalion. The musketry instructor was to be done away with ; the drill and musketry instruction to be imparted by the company Officers ; the Adjutant was to be the secretary and aide of the Colonel, and was not to interfere with the companies in the instruction imparted to them by their Officers. An organization has been established with four Majors, but I have not heard any one as yet state what the duties of these Officers are to be. There were two Lieutenant-Colonels recommended by the Royal Commission, one to take the place of the Major with the service companies or to command the dépôt with the home battalion. Now I am confident that Officers will never take interest in their companies, and the men will never look up to their Officers in a proper manner, unless the Officer is actually in command of the company at all times. At the present time, on an average from 120 to 200, and sometimes more, recruits join a regiment in a year ; these remain on an average six months at drill ; during that time the Officers commanding companies, except to sign their accounts and to see them in the barrack-room, have literally nothing to say to their men ; the Officers waste their time, not because they wish to do so, but because they are obliged to. The Officers I have met with have been most anxious to do their duty, and I have never found them grumble at any work I gave them. When at the Curragh, during the summer drills, there were three parades a day, and I never heard the slightest complaint from any of the Officers. The lecturer has said that Officers in the dépôts have nothing to do. Now, if he had seen a dépôt when both battalions were abroad, or when a battalion was augmented, and the recruits were arriving at the rate of 10, 20, or 30 per diem, he would not have said that those Officers have nothing to do. In one of the brigade dépôts under my command, 500 strong, the Officers had as much work as they could do, because they were obliged to drill and instruct their own men, and detachments had to be sent out, the barracks not being large enough to contain the whole of the large number of recruits necessary to supply the wants of the regiments abroad. In time of peace, I will admit that Officers at some of the dépôts have not much to do ; but you must remember that those dépôts were not established only for times of peace, they were intended not merely to equip the recruits, but at the dépôt the recruit was to remain three months, and receive his preliminary instruction. According to the present regulations, instead of carrying on the system recommended by the Localization Committee, that all recruits joining should be drilled for three months previous to being sent to their regiments, the orders are that they shall be sent on to the linked battalion at home as soon as they are clothed, and as soon as they can muster twenty to be sent together.

That is not carrying out the recommendations of the Localization Committee. But if those recommendations were carried out, and the recruits at the dépôt were formed into one company and drilled under the immediate superintendence of the Officers of that company, the system advocated by Sir Lumley Graham, by myself, and in the Appendix N alluded to, and which is carried out in all foreign armies, the Officers would then have full occupation and be usefully employed. What I advocate is, that men should be thoroughly drilled in preliminary recruit and musketry drill at the dépôt, and then sent to the battalions at home for battalion drill. The battalions at home should have no men at elementary drill with the exception of headquarter recruits. I do not quite agree that it would be advisable to localize our regiments, as proposed by the lecturer; if we were a country like Germany, no doubt it would be the proper plan. The localization system there is admirable; but our own country is differently constituted. I do not think that any regiment would enjoy being localized at, say, Athlone, Castlebar, Mullingar, &c. I do not think the system would, for other reasons, answer in Ireland; many disadvantages would arise from localizing in that country. There are places in England, such as Burnley and some of the manufacturing towns, where localization, as wished for by the lecturer, would be most unpopular. Imagine the feelings of an Officer gazetted to a regiment localized in one of these towns, and reflecting that whenever his corps was on home service he would be stationed at Burnley, &c. No doubt, if it were possible, it would in many respects be advantageous. It may also be said against localization as proposed, that there are many places where you cannot obtain recruits. The great majority of our recruits are enlisted in large towns; those men must be sent to some dépôt, and it does not very much matter to them whether they are sent to a regiment at Aldershot or elsewhere. The expenditure which our lecturer saves, I think, would be very doubtful, for I presume he would like these localized regiments to be assembled for military manœuvres; to send regiments down from the north of Scotland for manoeuvres at Aldershot, or to send regiments from all parts of Ireland for manoeuvres at the Curragh, is so expensive that it could never be done. When I was in command in Ireland I was most anxious, and the Colonels of the militia regiments were most anxious also, to have certain regiments from the west of Ireland brought up to the Curragh to undergo instruction once in every five years. We appealed to the War Office, and the answer was, that they thought the plan an excellent one, but the expense would be too much. I am therefore afraid that regiments localized in the north of Scotland and other out-of-the-way places would remain there, and would never come down to England. In regard to the proposal of the lecturer relative to cavalry, I differ entirely. My opinion is, and I believe it is that of many cavalry Officers, that if you have well-drilled cavalry soldiers and Officers you can easily drill the horses. I should like to see a regiment of 600 troopers with 300 horses: any one who has had any experience with horses will know that those 300 horses will go through four great field days a week, and that would be quite sufficient to instruct the 600 men. I would undertake, and many cavalry Officers have told me the same, to stand at the corner of the Regent Circus and to mount a cavalry regiment within an hour, if I was allowed to take the horses passing by; there would be no great difficulty in finding horses when required. The horses also are the most expensive portion of the regiment to keep up, because a horse, on an average, in a cavalry regiment will not last above six years. I should be very sorry to see the depôts done away with. It was my fate when the Crimean War broke out to be left in England for the first two or three months (when the regiment went on to Malta) in command of a dépôt. There was no organization for it. We were ordered to form dépôts at home very much in this way: A commanding Officer was dug up from half-pay, an Adjutant and a Quartermaster from somewhere else. There was no sergeant-major, no quartermaster-sergeant, no drill-sergeant, no mess for Officers or sergeants; it was totally impossible to carry out the instruction of the crowd of recruits who poured in. We must have dépôts ready to be a point of formation when the headquarters of regiments embark. Had I time, I would go into a system of organization which I think would meet every want: but I am sure gentlemen have heard enough from me.

Captain BARRINGTON, R.A.: I should like to make one or two remarks with

reference to the able lecture we have heard. It seems to me to go very much beyond what any of us can expect will be done, but in one respect it has not touched upon a very important part of the subject generally, and that is, the arming of the troops. One great object that I conceive the lecturer has, is to bring together the various branches of the Service, the regulars, militia, and volunteers, and even his reserve battalions, I perceive, are formed of supernumeraries from various sources, including the militia and even the volunteers; but in the hasty bringing together of these men it must be remembered that the regulars and militia are differently armed, and it would create confusion and difficulty in training the militiamen thoroughly in the use of the arm to which they have not been accustomed, and, of course, it would be impossible that they should carry the same arm that they previously had; therefore, I think it would be an essential point that the militia and the volunteers also should, as soon as possible, be armed similarly to the regulars. There is not only the objection with regard to the different arms, but what follows in consequence, with regard to the different ammunition in the field, and all reserves would have to be calculated with reference to two or three kinds of ammunition instead of with reference to one. For infantry you would have the Martini-Henry ammunition and the Snider,¹ and all ammunition columns would have to be considered with reference to these, as well as the regimental and field reserves, and this could hardly fail to create confusion in supplying ammunition in the field. Again, even with the Martini-Henry arm there is a different ammunition required for the cavalry carbine from that which is taken by the rifle, which is a very great disadvantage. The ammunition can no doubt be used on an emergency, but it is not primarily intended that it should be so. We want simplicity in these matters. As regards the excellent tables we see before us, there is one point on which I would observe: the establishment of the home battalions at a uniform strength of 650 appears to be low. Undoubtedly it is superior to the bulk of battalions under the proposed scheme, which number 480 rank and file only, but, inasmuch as 650 is recommended as a uniform battalion strength, it seems to me to be inferior to the proposed scheme in one respect, which proposes a certain number of battalions on a much higher establishment for emergent services, exclusive of the Guards, which have also a special establishment. I should prefer to have a uniform establishment of 600 for 50 of the 71 battalions on home service, and an establishment of 800 for the remaining 21, keeping the Guards as a reserve. The 21 battalions would be the infantry strength of one army corps, and would be available for a small war, or the equipment of the first army corps for a great army. In the other battalions you would have a uniform strength of 600, and to complete a second and third army corps we should draw upon the reserves to complete the establishments. The great and difficult task, no doubt, is the formation of a sufficient reserve, and I take it our requirements for a great army would be, as I think Captain James shadowed out, about three army corps. The bulk of the battalions being 600 strong, in order to create a reserve rapidly they should enlist about one-half or two-thirds of their strength for short service of three years, the men passing into the reserve for nine years more, and the remaining portion of the battalion might be enlisted for eight years' colour service, and four years in the reserve, which would give a proportion of older men, and all the 21 battalions should be uniformly enlisted for eight years with the colours and four years in the reserve, doing away with the linked battalion system and having depôts 300 strong to feed the battalions in India, and 200 strong to feed the colonial battalions. Then these depôts would enlist and train men to feed the battalions abroad, and the business of the home battalions, which need have no depôts, would be to form a reserve. That would be their primary work. Under the new scheme, men after three years' service will be allowed and even encouraged within certain limits to pass into the reserve, while at the same time all seven years' men must go into the reserve; and large drains having to be made upon battalions for foreign service, the arrangement will necessitate such an influx of recruits into the battalions that when they have to go on service they will have

¹ These remarks apply specially to the case of home defence at the present time, when the militia would have to take the field armed as they are with Snider rifles.

perhaps over one-third to one-fourth of the men under one or two years' service, which would be a serious evil.

Captain JAMES: There are very few points in the discussion which require reply. First, with regard to what Captain Lumley said about the number of Officers in the Prussian Service as compared with our own. I think a very common mistake is made in the mode of calculating the number of Officers. People are apt to forget that individual who in Prussia is known as the "Porte-épée Fähnrich;" he, to all intents and purposes, is an Officer, and you will see if you work out the war-strength of a Prussian company, with its Captain, its subalterns, and its "Porte-épée Fähnrich," who holds the same position in the Prussian Army as a midshipman does in our Navy, *i.e.*, although technically not an Officer he is practically one—you will see that on a war-footing the proportion of men to Officers in the Prussian Service is exactly the same as in our own. I quite agree with what Captain Lumley says about the Adjutant. I believe no one doubts now-a-days that the proper individuals to instruct the men are the company Officers. With regard to what Colonel Blundell said about the reserves being allowed to join the colours, I think that this should be permitted, especially for the drafts, which I propose to send annually to join the foreign battalion. If a man finds he cannot get employment and would like to return to his regiment, let him do so by all means. Say to him, "Here is a draft going out; you may join it and serve your eight years with it instead of the reserve." I think Colonel Blundell misapprehended what I said about the battalion. My 71 battalions of 650 strong come to about the same thing as the different varieties of strength proposed, and you get the advantage of having a more uniform organization. With regard to what Sir Lumley Graham said about training the men, my 650 men will give, roughly speaking, about 80 men for a company; but with regard to the numbers we get on parade, I cannot help thinking there is a point that we suffer from in England, and it is a point on which the Duke of Wellington remarked in the Peninsula, namely, the enormous number of men we consume as orderlies and servants. He said he never could get the British cavalry, because everybody who could get an orderly always insisted upon having one, and the cavalry was swallowed up doing duties for which it was not primarily intended. With regard to Colonel Norbury's remarks about my third battalion. My reason for having so large a proportion of the army service passed in the reserve, is that when you have filled up your home battalion to war strength, you will still have a sufficient number of men left to form the third battalion. I propose to make it 800 men strong as a first step; that gives you a dépôt of efficient and trained men, who would be able to take their places in the ranks and furnish drafts for the battalion engaged on active service abroad. If it were necessary to increase this number, then by all means call in your militia and volunteer reserves, but do not use them in the first place. With regard to Officers, I do not think it would do to take the Officers at one fell swoop from the militia battalion and put them into the third battalion, for they would know nothing of their men. If my Officers are taken in the way I propose, that is to say, if men who have served in the regiment form the reserve of Officers, the men who would form the third battalion would be in large proportion known to the Officers. I believe everybody will agree that the efficiency of militia Officers has increased *pari passu* with that of Officers of other branches of the Service; and the only thing I wish to ensure is that there shall be no case of a regiment having even one Officer who is not efficient. If that is not the case, what I say falls to the ground; but I think some system should be introduced by which the qualifications of everybody in the reserve forces should be tested. At present you may have, for instance, a commanding Officer who is known by all his battalion to be inefficient, but, nevertheless, he is allowed to stop on in command. I quite agree with General Herbert as to the duty of the Major under the new system. The duties of the Major are rather like the Spanish fleet. "The Spanish fleet you cannot see because it is not yet in sight." What he said with regard to dépôts seems to me to apply more particularly to the old dépôt battalion.

General HERBERT: The present dépôt.

Captain JAMES: The present dépôt, at the strength it is going to be, is, in my opinion (and I trust a good many people will go with me in that opinion), enormously over-officered. According to the present system, for 47 regiments, the strength of

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the dépôt is not to exceed 50 men in peace, and you are to have 5 Officers for that dépôt, excluding the Colonel, &c., and their sole duty is to look after these 50 men.

General HERBERT: You will have recruits?

Captain JAMES: Yes, but the dépôt, according to the proposed organization, is not to exceed 50 men.

General HERBERT: It would be as well to explain that those dépôts have to take the recruits for the whole regiment. You cannot say how many that will be, because the strength of the regiment may be less and the dépôt more, while in the total there will only be a certain number. The regiment should be 450 and the dépôt 50, but a regiment may be only 400 and the dépôt may be 100.

Captain JAMES: Therefore, it seems to me the more reason to amalgamate the home battalion and dépôt into one. With the system of small dépôts it is notorious that Officers have often nothing at all to do. With regard to the localization of regiments, I am perfectly sure you can never have proper mobilization until you have localization; for if the men are to join their regiments anywhere and everywhere, how can it be quickly and properly done? That because localization is adopted it is necessary to put regiments in out-of-the-way places, has yet to be proved. Personally I do not see that there is any such necessity. With regard to the expense of my plan. It would, of course, be necessary to assemble the localized regiments from time to time for manoeuvres; but moving regiments in marching order without impedimenta is far less costly than moving them as at present with all their baggage and women and children. With regard to the question of horses, certainly all foreign nations keep their cavalry on a war footing; and, so far as I am aware, they do not put it forward as their reason because their men cannot ride, and it is not only a question of putting untrained horses into ranks; but horses taken out of a civilian stable and treated as cavalry horses must be when in the ranks very liable to catch cold, which is often followed by a regular epidemic of influenza. Some Officers here saw the horses at Aldershot in 1878, which had been purchased when there was a probability of war, and they well know that a great percentage of them were incapacitated because they caught influenza. It is well known when you purchase large quantities of horses and take them out of stables they do catch cold in that way. That is a fact which shows to my mind very conclusively that it does not do at the last moment to purchase a large number of horses.

General HERBERT: The horses at the manoeuvres were all bought in that way, and there was no disease.

Captain JAMES: In 1866, when the Prussian Cavalry adopted this plan, they say that within a very short time after they went into the field they lost a very large number of horses from sickness, because they could not stand the exposure. Such a practical trial is worth any number of peace experiments, which may be conducted under peculiarly favourable conditions.

Captain LUMLEY: In Prussia no horse unless it has been a year in the regiment is allowed to go on service.

Captain JAMES: With regard to the collection of Officers for the third battalion, I say these are not a heterogeneous collection, but they are Officers who, if my proposals were carried out, would have served with the regiment in nine cases out of ten; or if not would at least have had a certain amount of training with the regiment. They would, therefore, possess an *esprit de corps*; therefore, it is not the case to say that Officers assembled together in that way are a heterogeneous collection of Officers. With regard to what Captain Barrington said, of course everybody knows our forces ought to have a uniform armament. This is a most important point. We have three different kinds of ammunition in the reserves—for the Martini-Henry, the cavalry carbine, and the Snider. It would not affect the men whether they were put into battalions with these arms or not, because the same thing would apply to a mobilization of the army corps, where militia and line regiments are brigaded together. I think there is nothing else to which I need reply.

The CHAIRMAN: The discussion has been so protracted that I think there is not time for me to say much regarding the lecture itself. The subject is one of very great importance, and I am sure we have all listened with the deepest interest to the lecture which has been given upon it by Captain James, and also to the valuable

discussion which has followed. Captain James pointed out a great number of blots in our present military organization, and although I am not in the secret's of the Government, I think I am in a position to say that a great number of the blots to which he referred have already been corrected—at least measures have been taken for correcting them—and when the reforms which are now being carried out have been completely given effect to, many of those blots will exist no longer. With reference to the number of guns, we are now following the example of foreign nations in reducing our number of guns in a battery from six to four during peace service, except in those batteries which stand first for employment. With regard to linked battalions, it would seem that he was not aware that the linked battalion system is to be converted into a system of double-battalion regiments, and henceforth the Army will consist practically of seventy large territorial regiments, each consisting of at least two battalions of the line, whose individuality will be merged in the regiment, and which will no longer be the individual integers they were lately. They will be of one regiment, in the same way as the battalions of the Rifle Brigade, or the battalions of the 60th. There will be also with them two battalions of militia, and I hope by-and-bye we shall see a considerable number of volunteers also forming an integral part of that territorial regiment, so that the territorial regiment may be a reality. It will, in fact, be a localized regiment, consisting of two battalions of the line, two or three battalions of militia, and several battalions of volunteers. I hope by-and-bye those bonds to which the lecturer referred, and which he said ought to exist between the several component parts of a regiment, may be drawn tighter, until these several battalions become really one great territorial regiment, which will inherit all the glorious military traditions which belong to its line battalions, and also those of the militia, for henceforth the militia will form a very important part of our regiments. With regard to the cost of the frequent movement of troops from station to station, it has certainly hitherto been a very important item in our military expenditure year by year. Formerly, no doubt, there were very good reasons for moving regiments from one part of England to another. It seemed to have been a generally recognized rule that no regiment should ever be left more than one or two years in any one place or town. I hope that will soon be altered; and even with regard to sending regiments abroad and bringing them home, I hope that as no man can in future be kept very many years abroad, owing to the short term for which he is now enlisted, it may not be necessary to relieve the headquarters of battalions abroad so frequently as was necessary under the long service system. I have no wish to see the creation of local regiments abroad, that is, essentially Indian or colonial regiments. In future the battalion of the territorial regiment serving in India will be relieved at a greater interval of time than the regiment used formerly to be relieved, and it is very easy to see why that can be done without hurting the Army in any way whatever. The men only will be kept in India seven or eight years—never more; the Officers will go from one battalion to the other, as is the case in the 60th Rifles and in all our old double-battalion regiments. They will be able to exchange from one battalion to the other without losing their position in their regiments, a privilege which I think will soon cause the Officers themselves to appreciate the advantages arising from the system of these territorial regiments. Lord Waveney, and also General Herbert, referred very pointedly to the younger Officers of the Army. I do not think any man in the Service has a higher appreciation of the young Officers of our Army than I have. I believe that it is upon the company Officers that success depends more than upon any other class of men in the Army. If the company Officers know their work well, and do it well, as I think they always do in the British Service, success is almost a certainty. My own experience as a company Officer, of course, is not as extensive as that of General Herbert's, but I can only say that in the campaigns in which I took part as a company Officer, I always felt that everything depended upon me as Captain commanding a company, and I think that was the feeling entertained by the Captains generally in the Service. At the present moment I confess I agree entirely with what Captain Lumley has said—that the young Officers of our Army have not enough work to do. I fully agree that they are able to do anything, but my experience, gained by moving amongst them now, is that they do not grumble at what they have to do, but they grumble because they have nothing to do. In times gone by, when I joined the Service, company Officers were given the most frivolous

duties to perform. But few recruits then joined the battalion annually, and they were drilled by sergeants and not by their Officers ; it was necessary to find something for our Officers to do, and, in order to give them some semblance of employment, they had the most trivial duties allotted to them ; such as going about the barrack-room during dinner-time, and asking the men if they had enough pepper and salt in their soup. When I first went into the Army, after the orderly room business was over—after 12 o'clock—the Officer of the Army had practically nothing whatever to do. At the present moment he is still an unemployed man during the greater part of the day, and I think that when there is so much to be learnt by Officers, and so much military instruction which they should impart to their men, this is very unfortunate. I believe one and all of the company Officers of our Army are quite prepared to undertake those duties, which in foreign armies (such as that of Prussia and Austria) are so effectively performed by the Officers, and I am quite sure when the time comes for giving our own Officers those duties, they will perform them as creditably to themselves and as usefully to the public service as is done by the Officers of corresponding rank in any other army in the world. I cannot sit down without referring to the number of companies in each battalion to which Sir Lumley Graham and General Herbert have alluded, and also to the duties to be performed by these new Majors, to which General Herbert has referred. I have never inquired what these duties are to be, but, as I understand it, the intention of the new organization is this : that we are to have actually the same number of Officers as heretofore, but in each battalion the four senior Officers in command of companies are to be Majors. They are to hold rank in the Army as Majors, as many of them at present do the brevet rank of Major ; and they will continue to perform the same duties in the future that they have done in the past. That is the interpretation I give to the new organization. I quite perceive the great difficulty to which Sir Lumley Graham alluded of giving Officers company instruction when the regiments are at a very low establishment, but it is one that is got over in many regiments of the Service. In my own regiment, when we had very few men on parade—say not more than 120, or less than that—we did not attempt to form a battalion, in fact, we never did but twice a week, but we formed the number of men on parade into companies of 60 or 80 or 100 men, and those companies were given over to two or three Captains present, and drilled independently as companies forming part of a battalion. The subalterns present were told off for duty with these three or four companies or with the one company, as the case might be. I maintain that as long as you have 100 men on parade you can, by forming them into one company, give most valuable instruction to Officers and men, not only in simple company drill, but in all the movements of a company when forming part of a battalion in the field.

Sir LUMLEY GRAHAM : That is a very different thing to a Captain instructing his own men.

The CHAIRMAN : That is quite right. I fully concur in the necessity of his doing that, and I hope that by-and-bye all recruits joining a company may be drilled by the Captain and other Officers of that company. I think this end will be secured when the Adjutant ceases to be a drill functionary, and becomes what he should be, namely, the Staff Officer of the Colonel. When this is done, the Captain and his subalterns will necessarily come to know the men of their company thoroughly. In the Prussian service, at the present moment, as Sir Lumley Graham mentioned, the battalions are very weak. A battalion on peace strength in Germany is not more than 420 or 430 men. I counted them myself very recently on parade, when they had about eighty men added for their manoeuvres, and the average strength was from 460 to 500. Then you must remember that one-third of those are recruits undergoing instruction, so that practically their battalions are really not stronger than ours.

Sir LUMLEY GRAHAM : Their recruits are all trained before the drill season commences ; they are put into the companies until they have been inspected by the commanding Officer and passed, so that by the time the drill season actually begins, the recruits are quite as fit to go into the ranks as the old soldiers.

The CHAIRMAN : I am sure I am echoing the views and opinions of everyone present in thanking, not only the lecturer, but all those gentlemen who have taken part in the discussion.

NAMES OF MEMBERS who joined the Institution between the 1st April
and 30th June, 1881.

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Evans, Thos. May, Captain Tasmania Artillery Volunteers.
Lyell, Francis H., Captain Royal South Gloucester Militia.
Goodfellow, W. W., C.B., Major-General, R.E.

Talbot, Lord Edmund B., Lieut. 11th Hussars.
Sewell, Sewallis A., Lieut. R.M.L.I.
Napier, Hon. J. P., Captain 10th Hussars.
Steel, J. A., Major-General, late Bengal Staff Corps.
Tanner, O. V., C.B., Major-General Bombay Staff Corps.
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Norton, Reuben, Lieut. 106th Regt.
Cromie, Chas. F., Lieut. 37th Regt.
Moffat, H. B., Captain 24th Regt.
Earle, Chas. W., late Lieut. Rifle Brigade.
Palliser, E. M., Captain, late 7th Hussars.
Stevens, Leicester B., Captain 3rd Middx. Art. Volunteers.
Skinner, P. L. MacG., Captain R.A.
Minchin, F. F., Lieut. R.A.
Gartside-Tipping, E. A., Lieut. R.A.
Hopkins, H. Castell, Lieut. 9th Lancers.
Bevan, Geo. Phillips, F.G.S., F.S.S., Deputy Lieutenant.

OCCASIONAL PAPERS.

This portion of the Number is reserved for Articles, either Original or Compiled, on Professional Subjects connected with Foreign Naval and Military matters; also for Notices of Professional Books, either Foreign or English.

It is requested that communications or books for review may be addressed to Lieut.-Colonel Lonsdale Hale, at the Royal United Service Institution, Whitehall Yard, London, S.W.

THE TRAINING OF INFANTRY FOR BATTLE—(continued).

Musketry Instruction.

WE now pass on to one of the most important branches of the Infantry Soldier's training, namely, target practice.¹

Although musketry instruction is really carried on throughout the year it is prosecuted with the greatest activity during the summer season, hence it may be considered as more peculiarly belonging to that period. It is the object of the most careful attention, being everywhere conducted with extraordinary zeal and method. Care is taken not to interrupt the course for any considerable time, lest the soldier should meanwhile forget the instruction which he has received and the observations which have been made to him, so that target practice is carried on even in mid-winter with 18° of frost (Fahr.).²

As musketry instruction is carried on throughout the army with perfect uniformity, it will be sufficient to explain how this is done in one of the corps of the Guard, commencing, however, with the remark that the Guards, and, generally speaking, all troops quartered in the large towns, are at a disadvantage in this respect, for not to mention the hindrance arising from the heavier garrison duties to which they are subject, they are further inconvenienced by the distance of the ranges from barracks, which is generally considerable, occasioning both loss of time and fatigue to the men, both of which are unfavourable to good shooting. Notwithstanding this, the

¹ Although a great deal that follows is extracted from, or founded upon, Colonel Kaulbars' report upon the German army, that author's statements have not been found so thoroughly reliable upon this as upon other branches of military training, not from any want of accuracy on the part of the writer, but because, since his book was published, considerable modifications have been made in the system of musketry instruction in Germany, particularly with reference to the most practical part of the course, namely, the "Gefechtsmässiges Schiessen" (Field-firing). Many of the latest changes made are evidence of the reaction against long-range individual firing, and are noteworthy on that account.

I refer my readers to that valuable little manual "Die Schiess-Instruktion für die Infanterie," for full information on this subject.—L. G.

² All weights, measures, and money values given in this paper are either exact equivalents, or, in some cases, to avoid minute fractions, very close approximations to the French or German figures given by the writers from whom I quote.—L. G.

regiments stationed in Berlin are so accustomed to these long marches, that they think nothing of having to go daily $2\frac{1}{2}$ or even $3\frac{1}{4}$ English miles for target practice ; and there are indeed many Colonels and Captains who consider it fortunate that the ranges are so far off, for they maintain that practice is in consequence carried on under conditions much more nearly approaching to those of actual service (the soldier only beginning to shoot after carrying his pack for an hour or an hour and a half), and that, moreover, this daily military promenade of two or three hours' duration is excellent marching practice.

One cannot fail to remark in musketry instruction, as in all matters, speaking generally, the intention which manifests itself throughout the German Army of doing nothing and of teaching nothing but what may be directly useful in war.

All Officers give their whole mind to the preparation of their men for the task which will devolve upon them on the battle-field, and exert themselves to the utmost both physically and morally to gain this end.

There is no better proof of this than in the care taken in all matters relating to musketry instruction, and in the very measures adopted for imparting it. I have sometimes had occasion to visit the ranges during target practice, and I have always been strongly impressed by the extreme zeal displayed, and by the notice taken of every firer and of every shot. Only one man fires at a time, and the Captain is almost always present to direct his men, and to give them the benefit of his advice, trying to develop by all means in his power not only a knowledge of the art of shooting, but a liking for it amongst those under his command. Should the Captain be by chance absent, another Officer of the company invariably takes his place.

The ranges used by the garrison of Berlin are all a long way from the town, except that of the second regiment of Grenadier Guards (Emperor Francis), which is close to the barracks. The other regiments have not less than an hour or an hour and a half's march to go to their ground ; the Fusilier Guards, indeed, who are the worst off in this respect, having their range near the Tegel, at least four miles and a half from barracks.

The general disposition of all these ranges is exactly alike.

According to regulation a three-battalion regiment should have at its disposal nine ranges, of which two for 656 yards, three for 437 yards, and four for 328 yards.¹

Local circumstances of course do not always admit of the desirable amount of space being available, and, in this respect, practice grounds differ somewhat from one another.

Wherever it is possible to get greater length, the authorities are glad to take advantage of the opportunity, and they consider 656 yards the minimum. In consequence of the development of agriculture in Germany it is often very difficult to find a good site for target practice, particularly near the large towns, but the Government has nevertheless succeeded in allotting separate ranges to every regiment in the Service. Most of the land devoted to this purpose is situated in the midst of woods or of forests as it is very seldom to be obtained in the open country, which is generally cultivated. A series of parallel rides are usually cut through the wood, as far as possible from north to south, the targets being placed at the north end, so that the shooter should always have the sun behind him.

¹ These rules have been somewhat modified by the latest regulations; a three-battalion regiment's nine ranges are now divided as follows :—

Two for 656 yards.

One " 437 "

Six " 328 "

(See "Schiess-Instruktion für die Infanterie," 1880, page 6.)—L. G.

These rides are only twenty paces wide, with intervals of from thirty to a hundred paces. Their length varies, but is never less than what has been above stated. The ranges are entirely at the disposal of the regiment to which they are allotted, and the only precaution generally taken is to dig a simple ditch round the practice ground, setting up along it a line of posts with the brief notice. "Those who cross the line of fire, run the risk of being shot." There is no fence round the ground, even near large towns, and it is thought much better to employ soldiers in learning to shoot than in mounting guard round the range to keep out trespassers.

Experience has justified this mode of proceeding, and one never hears of any accidents. People know what to expect, and take good care to keep out of harm's way.

At the end of each ride a great butt is constructed, about 36 feet high, for the purpose of catching all balls which miss the targets, the latter being placed in front of the butt with little epaulets on each flank to aid in stopping the bullets. Cover is made for markers at the foot of the butts in the ground between the rides. It is worthy of remark that, with ranges thus disposed, it is rarely necessary to make allowance for the strength or direction of the wind, which is but little felt in the middle of a wood, so that there is no opportunity for practising the men in this respect.

Most Captains, however, attach no importance to this, as they say that a good shot will always know how at need to regulate his aim according to the wind, and even regiments whose practice grounds are in the open are fond of planting trees in the intervals between the ranges. All the practice grounds which I have visited appeared to me very well kept.

We will now describe the arrangements for target practice: 130 ball cartridges are issued annually to each soldier, whether Officer, non-commissioned officer, or private. That is to say, the Captain of a company in the Guards whose effective strength is about 160 receives altogether 20,800 rounds for his men. To these must be added rounds given in excess of the regulated number in exchange for old lead, but the company has first of all to give back, without any compensation, half the weight of lead corresponding to the cartridges which have been expended, and only has a right to new cartridges in exchange for the surplus, the Captain, moreover, having to make good the deficiency should half the lead not be forthcoming. Hence great care is taken to look it up, and after each practice men are told off, generally the markers, to search the butts and afterwards to repair them.

All Officers of a battalion have to go through the whole annual course of musketry under the Commanding Officer. Aiming drill, firing with miniature ammunition,¹ judging distance drill, and firing blank cartridge, are all

¹ Until 1879 a special practice musket, called "Ziel-Gewehr," "Bolzen-Gewehr," or "Wegnerisches Gewehr" (aiming gun, bolt-gun, or Wegner's gun), was used for practice in the barrack passages, but was then superseded by the issue of a special cartridge for use in the ordinary rifle.

The following description is extracted from a little manual of instructions issued to the German army, and for a copy of which I am indebted to the German military Attaché, Major von Vichtenhoff.

The ammunition for aiming drill is composed as follows:—

The paper cartridge,
The metal case, and
The detonator.

The paper cartridge consists of a thin paper wrapper containing a charge of .6758 dr. of service powder or of fine sporting powder furnished by the trade, upon which is placed a cardboard disc hollowed out in front to receive a spherical bullet .3543 in. in diameter. The paper wrapper is choked over the disc and bullet being greased to .4 in. beyond the upper side of the disc.

The brass case consists of a service metallic case, selected from those of greatest

preparatory to target practice. We have already noticed that even during the recruit period most Captains put the rifle into the soldier's hands from the very first, and try by that means to get him on to the shooting as soon as possible. At almost all individual drills, whether for old soldiers or recruits, they begin by some aiming practice. Many Officers use for this branch of instruction a special instrument, which they call "aiming glasses." These are really in the shape of ordinary spectacles, and are placed on the nose in the same way. On the left side there is a piece of plain glass, but on the right side a piece of looking glass, having in its centre a little circular hole, and its silvered side towards the eye. The soldier puts the glasses on and aims through the little hole at the eye of the instructor who stands in front of him, and who, seeing in the mirror the reflection of the barrel, and of the sights, can at once detect and rectify the slightest error in the soldier's aim. I am not able to judge whether this apparatus is of practical utility; it is well spoken of by many, at the same time it is not approved of by all, and some companies make no use of it.

Another good preparatory exercise is practice with the miniature cartridge, which is generally carried on in barrack yards, passages, riding schools, and such like. It pleases the men and gives them a taste for shooting, so much so that they often amuse themselves in this way in their spare time, or when they are "sick in barracks." No practice with the "miniature cartridge," however, is allowed except in presence of the non-commissioned officer of the week.¹

* * * * *

In some regiments the most serious attention is paid to training men to judge distance accurately within the usual limits of field firing, that is to say, up to 550 or 660 yards. Various kinds of apparatus for this purpose have been tried in the Prussian Army, but none of them seem to be of much practical advantage nor to be available for use by the general run of soldiers,

length, within which is a bronze cylinder filling up all the space not occupied by the paper cartridge. A channel is bored through the centre of this cylinder, and is conducted right up to the point of the striker, serving not only as vent but also to facilitate the removal of the detonator.

The detonator is the usual service one with a flat base.

The ammunition above described is made up by the men themselves, full instructions for the purpose being contained in the manual.

The recoil of the rifle being much slighter when fired with the miniature ammunition than with the service cartridge, a modification of the sight becomes necessary for use in the former case; hence an auxiliary foresight is applied to the barrel by means of a brass plate, and the lower flap is used in aiming instead of the fixed back sight.

The piece is discharged in the same way as with ordinary ball cartridge.

Targets are used of the same description as those employed at target practice, only of one-fifth the ordinary dimensions, and the same degree of accuracy may be depended upon in firing at them with the miniature cartridge at 22 yards, as when using the service ammunition against ordinary targets at 175 yards.

The miniature bullet will penetrate a 2"2 deal board at a short distance, and will carry to an extreme range of about 550 yards, so that all necessary precautions must be taken as when firing with service ammunition.

Thanks to this invention, the soldier can occupy his spare time with miniature target practice in barracks, and becomes accustomed betimes to the very weapon which he will use at the ranges and in the field.

An apparatus of the same description, but apparently of a more complicated nature, has been for some time in use in the French Service, having been fitted to the Chassepot rifle (1866), and a similar apparatus for the Gras rifle (1874), is on trial; range 16'5 yards to 49'5 yards; charge .2252 dr.; leaden bullet, cylindro-ovoidal and .4331 in. in diameter, 4.055 drs. in weight.—L.G.

¹ The author proceeds to describe judging distance drill, but as this is practised in exactly the same manner as in our service, the description may be omitted.

so that care is taken to accustom them to judge distance by means of the only instruments at their disposal, that is to say, by the eye and the rifle.

And yet there are a great many Officers in the Prussian Army who do not believe in the necessity of teaching men to judge distance. Many Captains do not make it a separate subject of instruction, but content themselves with pointing out to the shooters, when at target practice, the difference presented by the appearance of the markers at the various distances. These Officers assert that all the other processes though sound in theory are inapplicable in practice, and that it would require a long experience to get any real good from them. "It is of no use," say they, "practising such things only 'occasionally'; you must be at it continually, which is impossible for want of 'time and of suitable ground. No Captain has the power to give all his 'men instruction of this kind which from its very nature must needs be 'imparted individually, and must be repeated frequently. Besides, on the 'field of battle, this power of judging distance will be nearly useless, for there 'will be no skirmishing fire of any consequence beyond 550 yards, up to 'which range the trajectory of the Mauser rifle is so low that we can always 'count upon effective practice. Again, when thus near the enemy the struggle 'becomes so violent that one cannot count upon the men having sufficient 'coolness to think of the distance and of the rules that should guide them in 'judging it, which rules it would be all the more difficult to act upon seeing 'that at such a moment the enemy would to their eyes present a very different 'appearance from what has been supposed to represent him at drill, for instead 'of having always before them soldiers standing upright and completely 'exposed to view, they would be opposed to men taking every advantage of 'the ground to conceal themselves and constantly changing their position."

Influenced by all these reasons, and by the fact that the dangerous zones at the different distances to a certain extent overlap one another, many Officers think that the best plan to pursue on service is not to allow all the men to fire with the same elevation, but to make them use two or three different sights. Thus, for instance, a Captain when deploying his company, will order his three divisions to fire respectively at 550, 660, and 770 yards, though directing their fire on the same object, and as in all probability the said object will be within these limits, whilst the whole field up to 770 yards, and even beyond, will be under fire, one may take it for granted that the enemy will be under fire also. If, on the other hand, everyone uses the same sight, and it happens not to be the right one, the ammunition is simply wasted. This system of covering a broad belt of ground with fire is very popular in the Prussian Army, and many Officers tried to apply it during the last war (1870-71).

Whatever may be the method of preliminary instruction employed in other respects, special attention is given by all to obtaining a great degree of regularity in bringing the rifle to the present and in pulling the trigger. Movable targets being fired at on the practice ground the soldier is exercised previously in the barrack yard, by way of preparation, in aiming at a man, on the move at some distance from him. He is also taught to aim in various positions : lying down, kneeling, standing up, with and without a rest, &c., so that when he reaches the ranges target practice may at once be proceeded with.

It is also found a good plan never to send many men at a time to the practice ground, and as a rule firing parties consist of from ten to twelve men, under a lance-corporal or non-commissioned officer. On reaching the ground the men take off their knapsacks, sit down and rest for twenty minutes if they have marched any distance ; then fire their five rounds and march home again.¹ Thus, for instance, in the regiment of Fusilier Guards, each party

¹ The minimum number of rounds fired by any one man at a practice is five, but if any man fails in complying with the prescribed conditions within the five rounds,

spends about an hour at the ranges, and takes at least three hours in marching to and fro. The soldier must thus be four hours under arms, with knapsack on, to arrive at firing five rounds, and a company takes six or seven hours, sometimes more, to get through its day's shooting, so that the Officers who have to remain all the while at the ranges to give instruction have no easy time of it, and most of them ride to and from the ground. The usual custom is not to allow a man to fire more than five rounds at a time, but Captains have of course the power of giving to individuals a few additional cartridges.

The whole regiment, Officers included, is divided into three classes for shooting, and everyone is expected to fulfil the conditions laid down for his class, however great may be his skill as a marksman independently of those conditions. The course of practice for each class lasts a whole year, and you can in no case pass from one class to another under that time.

The third class thus comprises only men in their first year's service, and those of previous years who have not arrived at fulfilling the required conditions. The second class, in like manner, consists of men in their second year's service, and the three-year men who have not qualified for the first class, which is thus composed only of the best shots who are also serving their third year. Besides these three classes, a fourth has been formed this very year (1876); the special class (*besondere Schiess-Klasse*), which is confined to non-commissioned officers who have proved themselves good marksmen by qualifying two years running for the first class, and to Officers on the same terms, as we shall see further on.

In drawing up the rules relating to each class the authorities have acted on the principle that practice at short ranges is the most instructive of all, and contributes best to improve the marksman's skill; hence the conditions imposed at the short distances are relatively the most difficult of attainment, and the greatest number of rounds is expended at short range firing, because it is held that where a man can make good practice at an object near him he will always be able to hit the mark when a little further off. Hence, what is chiefly desired is that men should be thoroughly trained to shooting up to 275 yards.

The consequence of this system, and of the division into classes above mentioned, is that the whole of the German infantry does not practise firing at all the distances, and that most of the men have not fired individually at long ranges. It has been shown by experience in the field that it is unnecessary to train every soldier up to this point, as serious fighting between skirmishers is never carried on beyond 660 yards. If it should happen, as it does indeed, pretty often, that they open fire at a greater distance, this fire is never hot, and the best marksmen, that is to say, the first class shots, will be numerous enough for what is wanted. Not but what the Germans admit the advantage of all soldiers being able to shoot well at long ranges, but as they find it practically impossible to arrive at this result, they prefer making a point of training the mass of their men thoroughly to short range firing rather than wasting cartridges in trying to make awkward fellows hit the target at long ranges.

During the war (1870-71), the Germans often found themselves obliged to open fire at very long distances, but this always occurred quite at the commencement of an action, when a battalion or a company was trying to keep concealed behind some natural cover, and had no need of keeping up a heavy fire. In such cases it was found sufficient to send forward the best marksmen for the purpose of maintaining the fire. When, later on, the fight waxed warm as they drew nearer to the enemy, they could break up whole companies

he may be required to fire as many as ten before leaving the ground. See the "Schiess-Instruktion," pages 22, 23.—L. G.

to skirmish, and thus obtain as powerful a firing line as was required. To resume, what the Germans specially aim at is to make the general run of infantry soldiers shoot well up to 660 yards, without troubling themselves much about the longer ranges, for which the first class shots will suffice, the latter having not only to satisfy all the special requirements demanded of this class by regulation, but being particularly trained to shooting at the longest ranges, their practice being carried on in presence of their comrades who may thus profit by the instructor's remarks. Special sites are devoted to long range practice as sufficient distance is not available on the ordinary ranges.

Now let us see how instruction is given. The first thing is to have good instructors, and in order to obtain these, the greatest care is taken in making good marksmen of the Officers and non-commissioned officers, who are expected not only to be able to explain the whole theory of shooting, but also to be so far practically acquainted with the art as to test any rifle, and to discover any possible defect in it. Commanding Officers of regiments and battalions have special charge of this branch of the subaltern's education, whilst commanders of companies see particularly to the training of their non-commissioned officers.

Everyone without exception, Officers, non-commissioned officers, and privates, including Adjutants, Company Sergeant-Majors, orderlies, &c., have to go through the whole course, not only of target practice, but also of preliminary drills, including position drill in all positions, firing with miniature ammunition and with blank cartridge. At target practice, the Officers have, just the same as the men, to go through all the details of the different kinds of firing and to satisfy all the requirements laid down for each kind of exercise and for each class. They are, like the men, divided into three classes, according to their skill, and are not allowed to pass on from one class to the next without having followed the whole course of exercises prescribed for the former and without having obtained the requisite number of points whilst firing the number of rounds fixed by regulation. Here we find more than ever clearly established and rigorously applied the principle that *the Instructor should always know thoroughly whatever he is expected to teach others.*

These views have been completely justified in practice, and I have more than once had occasion to testify to the remarkable zeal and intelligence displayed by Officers in giving instruction. Thus, very often an awkward soldier would find fault with his rifle, upon which the Officer, seeing that the man had lost all confidence in his arm, would take it from him and make a capital shot. The effect of this practical demonstration on the owner of the rifle and on all bystanders will be well understood. If, on the other hand, a rifle appears to be really defective, it is placed on a rest, the Officer fires several shots with it, ascertains the nature of the defect, and explains to the soldier to what point he should specially attend when making use of it, or else, if need be, orders it to be sent to the armourer.

However this may be, the Officer has none the less settled the matter, and the men look up to him always and everywhere as the authority to whom they are bound to defer. What contributes to this same result is the extreme zeal with which Officers conduct the musketry instruction. The men are divided into squads of five, and are placed in file one behind the other; the first loads, aims, and fires, during which the Officer stands near him, following all his movements, rectifying his position, and giving him the advice suited to his particular temperament, with which the Officer is well acquainted. Having fired, the soldier stands fast till the marker has signalled the shot. Then closing one pace to the flank, he repeats aloud to the instructor, "Private —— aimed at such a point, and hit such another 'point,' or as the case may be. Then he takes post in rear of the squad, and so on until they have all fired the proper number of rounds. Not far off,

a non-commissioned officer is seated at a little table under shelter, if need be, of an enormous canvas umbrella, and notes down every shot in the company register, besides which, each soldier's shots are noted in his own small book, so that he can at any moment tell how he stands with regard to target practice, to what points he must pay particular attention, and what he has yet to do before he has qualified for the next class or to complete the practice of the class to which he belongs. Every soldier is expected to know at all times the position which he occupies as a marksman. It often happens than an Officer, meeting a man in the street, questions him suddenly upon this subject, and the man must give the most detailed information in reply.

It is thought highly important that the firer should know exactly at what part of the target he was aiming when his gun went off, and no better means can doubtless be devised, both for instructors and firer, of regulating and appreciating the shooting.

At the head of the company target practice register is the roll of all field and company officers who are on its strength, followed by that of non-commissioned Officers and privates. For each one of these, including the Colonel of the regiment, who is shown on the roll of No. 1 company, there are several pages, so many per class, and every shot with its consequences is entered in its proper place. The conditions relating to each class are printed in this book, so that a soldier can always tell at a glance what his progress has been and what more he has to do.

As an example of the zeal and care taken by the Officers in the instruction of their men, we give the description of the method, pretty often adopted in the army, to cure young soldiers of their fear of the firearm, that is to say, of that involuntary trembling of arm and body, together with the habit of shutting the eye at the moment of pulling the trigger, to which very many men are subject, although endowed with plenty of nerve and vigour.

You give the soldier a rifle at full cock ; he places it on the rest, aims generally for some time, and at last pulls the trigger. The gun does not go off, because it was not loaded, but the soldier, being unaware of this, has none the less trembled and shut his eyes. As may be supposed, this involuntary movement, for which there was no valid reason, is very annoying to the poor fellow, principally on account of the laughter which it excites amongst his comrades. The Officer, however, points out any errors which he may have committed in the way of taking aim, &c., and he returns to his place in rear of the squad as if he had fired. When his turn comes again, the Officer takes his rifle from him, stands aside for a moment, and returns it to him at full cock, the same as the first time. Our friend, quite sure this time that his piece is loaded, screws up his courage and pulls the trigger ; another miss-fire. The same thing is repeated two or three times. At last, feeling pretty sure that he will not have to fire at this drill, he takes the rifle, and pulls the trigger with perfect steadiness. To his astonishment the gun goes off, but the marker signals a miss ! it was a blank cartridge : General laughter. The poor fellow is much confused, and begs that he may be allowed to fire at least one shot in the usual way. The Officer makes no promise, or says that for to-day it cannot be, and orders him back to his place to take his turn. He tries again : another miss-fire ! He now resigns himself to his fate, and, making quite sure that he will not be allowed to fire a single ball cartridge on this occasion, pulls the trigger next time with perfect steadiness. The gun goes off, and the marker signals a good shot. The soldier, particularly if a recruit, is delighted, and reports where he aimed, and where the ball struck, with evident satisfaction. The Officer then congratulates him, explaining that his shot has been a good one simply because he fired steadily, and recommends him to do the same always in future.

His comrades also congratulate him, and the Officer improves the oppor-

tunity by saying to some bad shot: "Just look, Müller, into your small book, and see whether you have made as good a shot as that during your three years' service. There is Schultz, who has only been in the regiment two months, and who has begun by making a centre."

Schultz is naturally proud of himself, and Müller ashamed of himself, but both make up their minds, the one to maintain the position which he had never dreamt of reaching all at once, the other to do better in future. It stands to reason that there are various ways of working out this system, and that each Officer judges for himself how to apply it, but in all cases I have remarked with what extreme care instruction is imparted, whatever the method adopted, and it frequently happens that, by acting on the plan above described, fire-shyness has been cured in five or six shots.

As a general rule there is only one target on each range at the practice ground. Three markers are attached to it, one of whom marks the shots, the other plugs the holes, while the third, who is seated behind the epaulement, raises a flag the moment he hears the shot. As long as this flag is raised, no one can fire. As soon as the other two markers are under cover, the flag is lowered and shooting goes on.

No signals are allowed either by voice or by bugle, all communications between the firing point and the markers being made by men passing along the range. This rule is necessary because of the arrangement of the ranges side by side in several parallel rows, which might cause signals by sound to be confused with one another, and hence occasion accidents. During the whole duration of the practice no men are under arms on any one range, except the squad of five who are actually firing. All the others are allowed to take off their accoutrements, to unbutton their uniforms, and to lie down in the shade. They are also allowed to smoke, as are, by the way, both the non-commissioned officer who keeps the register and the one who is superintending the practice, both of whom perform their duty pipe in mouth, even in presence of any Field Officers or Generals who may chance to attend. After once the proper compliment has been paid to those Officers, on their first arrival, everything goes on without constraint, the attention of all being concentrated on the target practice, and on the instruction of the firing party. The annual course of musketry instruction lasts from ten to eleven months, according to the time which elapses between the musketry inspection and the end of the great autumn manoeuvres. Immediately after returning from the latter, that is to say, from the middle of September, target practice begins for the three classes and continues as far as possible without interruption right through autumn and winter, after which up to the end of the course in July practice is carried on still more frequently. It would be difficult to say at what actual time the different periods of the course commence, for the regulations are silent on this point, leaving it to Captains to settle as they think best, but practically a certain progression has become habitual, varying, however, according to the climate in different parts of Germany.

In September the men of the three classes begin their respective courses of instruction. As in winter the weather is not often favourable for target practice, they do not do much in that way, only just enough in fact to prevent them from getting out of practice, and from forgetting between the lessons what they have learnt. There are, therefore, only two target practices a-week for each man. But from the commencement of March, when the weather begins to get a little warmer, they work in earnest, so that all the classes may have got through their course¹ before the period of field service begins.

During this period musketry instruction continues, but consists principally

¹ That is to say, that part of the annual course which is called the "Schul-Schiessen," which we shall describe further on, and which constitutes the *course*, properly so called.

of the "Belehrungs-Schiessen," and of the "Gefechtsmässiges Schiessen" (to be noticed further on), which must be completed before the musketry inspections, after which there is a little lull, and up to the time of the manoeuvres there is, as a rule, no rifle drill except for awkward men. The course of instruction for recruits begins as soon as possible after their incorporation, that is to say, as soon as preliminary drill is over, and as soon as the weather permits, for it is thought a very bad plan to make a recruit practise for the first time under unfavourable conditions, as the bad effects of a first impression will tell on this sort of drill more than on any other.

The annual course is divided into three parts :—

1. "Schul-Schiessen" (shooting drill).
2. "Gefechtsmässiges Schiessen" (field practice).
3. "Belehrungs-Schiessen" (practice for instruction).

The "Schul-Schiessen" takes up the greater part of the time devoted to the annual course. The greatest care is taken in its execution, and in its regular progression, particular attention being paid as aforesaid to short range shooting, at which most of the ammunition is expended by all three classes. There is a special programme for each class, whose course is, moreover, subdivided into "preliminary" and "principal practice" (Vorübung, Hauptübung). Every soldier belongs to the third class during the whole of his first year's service. In order to pass successfully into the second and first class during the two following years, he must, with a certain specified number of shots, produce a specified result.¹ Each of these conditions consists virtually in putting so many balls out of five at each separate exercise into such and such a target, at such and such a distance, and in such and such a position ; upright, kneeling, lying down, or using a rest of some kind, &c.

TABLE OF TARGET PRACTICES.

3RD CLASS. PRELIMINARY PRACTICE.

No.	Yards.	Position.	Target.	Sight.	Point aimed at.	Mean Distance allowed above the point aimed at.	Conditions.
1	110	Standing, rest	Line target	Fixed back-sight	The mark	24"·4 in the line	5 hits, of which 2 on the line.
2	110	Do.	Do.	Do.	Do.	Do.	5 hits, of which 3 on the line.
3	110	Do.	Infantry target	Do.	Do.	24"·4 in Ring No. 3	5 in oblong, of which 4 in mirror.
4	110	Standing, free	Do.	Do.	Do.	Do.	5 in oblong, of which 2 in mirror.

PRINCIPAL PRACTICE.

5	165	Standing, rest	Infantry target	Fixed back-sight	The mark	27"·1 in Ring No. 3	5 hits, of which 4 man's breadths with 3 oblongs, including 2 mirrors.
6	165	Standing, free	Do.	Lower flap	Do.	49"·1 in Ring No. 3	5 hits, of which 3 man's breadths with 2 oblongs, including 1 mirror.
7	165	Kneeling	Figure target	Do.	Do.	49"·1 in the breast	3 figures with 2 oblongs.

¹ I add tables showing the details of target practice in the three classes, also the conditions which qualify for promotion to a higher class. This information is extracted from the "Schiess-Instruktion für die Infanterie," Berlin, 1880.—L. G.

No.	Yards.	Position.	Target.	Sight.	Point aimed at.	Mean distance allowed above the point aimed at.	Conditions.
8	165	Lying, rest	Do, upper, two-thirds	Fixed back-sight	2 head-breathds under the mark.	27''-1 in the breast	3 figures.
9	220	Standing, rest	Infantry target	Do.	The mark	21''-6 in Ring No. 3	5 hits, of which 3 man's breathds with 2 oblongs.
10	220	Standing, free	Do.	Lower flap	Do.	49''-6 in Ring No. 3	5 hits, of which 2 man's breathds with 1 oblong.
11	220	Lying, free	Figure target	Do.	Do.	49''-6 in the breast	2 figures.
12	220	Lying, rest	Do.	Do.	Do.	Do.	3 figures with 2 oblongs.
13	440	Kneeling	Section target	495 yds.	Do.	41''-73 upper half of target	3 hits.
14	165	5 rounds by word of command, standing, free	Infantry target	Lower flap	Do.	49''-1 in Ring No. 3	4 hits.

For a description of the targets see page 506, and the accompanying plate, extracted from the "Schiess-Instruktion"—(L.G.)

2ND CLASS.

PRELIMINARY PRACTICE.

1	110	Standing, rest	Line target	Fixed back-sight	The mark	24''-4 on the line	5 hits, of which 3 on the line.
2	165	Do.	Infantry target	Do.	Do.	27''-1 in Ring No. 3.	5 hits, of which 4 oblongs with 3 mirrors.
3	165	Standing, free	Do.	Lower flap	Do.	49''-1 in Ring No. 3	5 hits, of which 3 oblongs with 1 mirror.

PRINCIPAL PRACTICE.

4	165	Lying, free	Trunk target	Fixed back-sight	2 head-breathds under the mark	27''-1 in the breast	2 figures.
5	165	Standing, free	Infantry target moving	Lower flap	The mark	49''-1 in Ring No. 3.	5 hits, of which 2 man's breathds.
6	220	Standing, rest	Infantry target	Fixed back-sight	Do.	21''-6 in Ring No. 3	5 hits, of which 4 man's breathds with 3 oblongs, including 2 mirrors.
7	220	Lying, free	Do.	Lower flap	Do.	49''-6 in Ring No. 3	5 hits, of which 3 man's breathds with 1 oblong.
8	220	Kneeling	Knee target	Fixed back-sight	Do.	21''-6 in the breast	2 figures.
9	275	Lying, free	Infantry target	Lower flap	Do.	43''-3 in Ring No. 3	5 hits, of which 2 man's breathds.
10	275	Lying, rest	Figure target	Do.	Do.	43''-3 in the breast	3 figures.
11	550	Kneeling	2 section targets placed side by side	605 yards	Do.	59'' in the upper half of target	3 hits.
12	220	5 rounds kneeling, by word of command	Infantry target	Lower flap	Do.	49''-6 in Ring No. 3	4 hits.

1ST CLASS.

PRELIMINARY PRACTICE.

No.	Yards.	Position.	Target.	Sight.	Point aimed at.	Mean distance allowed above the point aimed at.	Conditions.
1	110	Standing, rest	Line target	Fixed back-sight	The mark	24"·4 on the line	5 hits, of which 3 in succession or 4 on the line.
2	165	Do.	Infantry target	Do.	Do.	27"·1 in Ring No. 3	5 hits, of which 5 man's breadths with 4 oblongs, including 3 mirrors.
3	165	Standing, free	Do.	Lower flap	Do.	49"·1 in Ring No. 3	5 hits, of which 4 man's breadths with 3 oblongs, including 1 mirror.

PRINCIPAL PRACTICE.

4	165	Lying, rest	Head target	Fixed back-sight	2 head-breadths under the mark	27"·1 in the head	3 figures.
5	165	Standing, free	Figure target, moving Eclipse breast target	Lower flap	The mark	49"·1 in the breast	2 figures.
6	165	Lying, rest	Eclipse breast target	Fixed back-sight	2 head-breadths under the mark	27"·1 in the breast	2 figures.
7	220	Lying, free	Infantry target	Lower flap	The mark	49"·6 in Ring No. 3	5 hits, of which 3 man's breadths with 2 oblongs.
8	220	Lying, rest	Trunk target	Fixed back-sight	2 head-breadths under the mark	21"·6 in the breast	3 figures.
9	275	Kneeling	Knee target	Do.	The mark	7"·6 in lower half	2 figures.
10	275	Lying, free	Figure target	Lower flap	Do.	43"·3 in lower half	2 figures.
11	660	Kneeling	2 section targets placed side by side	715 yards	Do.	77"·9 in upper half of target	3 hits.
12	330	5 rounds kneeling, by word of command	Section target	Lower flap	Do.	27"·5 in lower half of target	4 hits.

Conditions Regulating Promotion from one Shooting Class to another.

Are promoted to second class those who fulfil the conditions of Nos. 5 to 12 inclusive in the third class with 70 cartridges or less.

Are promoted to first class those who fulfil the conditions of Nos. 4 to 10 inclusive in the second class with 55 cartridges or less.

It is also a necessary qualification for promotion that all the practices of the lower class have been gone through and all prescribed conditions fulfilled.

Reduction from a higher to a lower class is not allowable, but men who have difficulty in keeping up to the rest of their class receive the greatest attention from the instructors, and, if need be, an extra allowance of practice ammunition.

* * * * *

All who go through the School of Musketry pass as a matter of course on rejoining the regiment into the class immediately above that to which they belonged on being detached from it. Lastly, as before said, there is now for Officers and for the most skilful non-commissioned officers another class called the "special shooting class," the conditions relating to which are not fixed by regulation but by battalion commanders, who make what rules they like, modifying them from year to year, a mode of proceeding which enables them to try various systems and to form a more decided opinion as to the strong and weak points of their best shots. The same rules need not apply to the different battalions of the same regiment, but, on the contrary, there is often much difference between them. All we can say is that the conditions are generally very difficult and that it requires a good marksman to satisfy them.

To give an idea what proportion of men may be found in the different classes, I will cite, as an example, a battalion of the Guards which had at the end of the annual course in 1875 in the—

1st class,	105 men.
2nd "	290 "
3rd "	140 "

The 105 first class shots represent nearly a complete company on the peace footing. Being all in their third year's service, the greater part of them pass at the end of the year into the reserve, so that in case of mobilization, each battalion may count upon gaining from 100 to 150 first class shots, who being added to those already on its strength make up a body of from 200 to 250 marksmen, that is to say, the equivalent of a whole company on the war footing.

A four-company battalion will thus have enough good shots to meet all requirements, on which account the Germans do not think it necessary to have light companies in their battalions nor special rifle corps. The latter do indeed exist, but as we have before mentioned, rather for administrative than military reasons.¹

One might, indeed, fear that these marksmen would, after passing into the reserve, quickly lose the skill which they had acquired, and that, if recalled to the colours, they would not be up to the standard of their comrades on the peace establishment, but if this be true with regard to some, it is not generally the case, because rifle shooting is one of the most popular amusements in Germany, and consequently, men who have become good shots during their service in the army usually continue to have a taste for target practice on their own account, and continue to practise it after returning to civil life.

* * * * *

It is worthy of remark that in each class the difficulty of the exercises always steadily increases, the distances being, as a rule, prolonged little by little, and when, on the contrary, they are shortened, the target is changed, and the conditions under which the firing is conducted are modified. And even if the firer is brought nearer to the target, he finds difficulties of another nature. In short, the same course of progress is continued from one class to another, and moreover, the practice in each class begins with some of the most important exercises of the one preceding it. Hence the progression is perfectly continuous.

¹ We have already explained that the "Schützen" and "Jäger" battalions are maintained chiefly for the purpose of feeding the corps of State Foresters.—TRANS.

Since the War of 1870-71 eleven battalions of Jäger have been broken up and eleven other battalions have been converted into line regiments, only one battalion of Schützen and nineteen battalions of Jäger remaining.—L. G.

It is also interesting to remark that in a great many cases firing is done from a rest. This is not always the regular machine used at aiming drills, and by which the whole barrel as well as the firer's arms are supported. The rest used at target practice is a special one, consisting of an upright supporting a transverse sloping board, the upper face of which is so grooved as to present a series of horizontal steps arranged so that every man can suit his own height and lean his rifle lightly on one of them. This firing from a rest is much thought of in Germany, particularly for beginners, as it gives them an idea of the precision with which the line of sight should be directed on a certain point of the target, so that when the man arrives afterwards at shooting with a free arm he involuntarily tries to give his arm the same rigidity to which he has become accustomed when firing from a rest. The latter, then, is an excellent preparation for the other mode of firing, and is practised by all the three classes, particularly during their earlier exercises. Moreover, it is thought that this mode of firing should be familiar to all because it will very often be necessary to have recourse to it in the field. To this it may be replied that whoever can shoot well with his arm free will never fire the worse for having a rest. But experience has shown that this does not exactly follow, and all good marksmen are of opinion that shooting from a rest comes by no means easy to those who are accustomed to do without it, because it renders a peculiar position necessary which requires a certain amount of practice.

Firing from the knee is always done with the arm free, either from one or both knees as is found most convenient. In the former case the elbow is generally rested on the knee which is kept upright, but if you kneel on both knees, you keep the body straight and fire as if standing up.

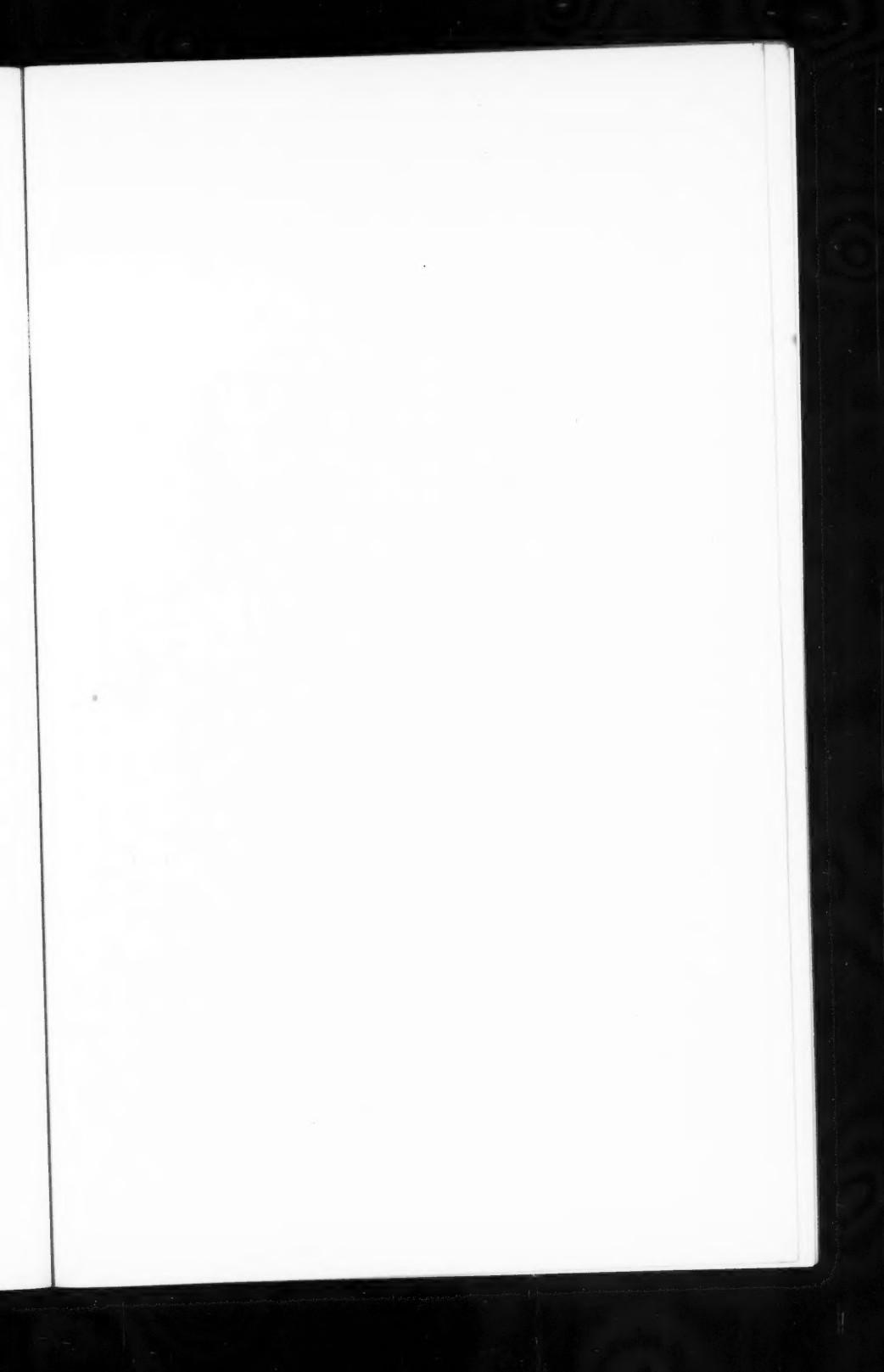
The position which is thought the most difficult is lying down with free arm, but with elbow resting on the ground. When firing with a rest lying down you generally lean the part of the rifle between the muzzle and middle band on anything which comes handy. On the practice ground, sand bags, little hillocks, or a bit of parapet answer the purpose.

A few words now upon the different targets in use.

1. The "Strich-Scheibe" (Line Target) is 6 feet high and 4 feet wide, painted white, and bisected longitudinally by a black line 4 feet 6 inches wide, ending in an anchor mark at both top and bottom, the latter being the mark aimed at.

This target is used more especially to show the firer that even if a shot be too high or too low it may yet hit an enemy and produce a good effect, whereas, even a small deviation from the right direction would render it useless. By shooting at this target men are trained to hit a narrow vertical line, that is to say, to get the right direction. Great importance is attached to this, and the first series of shots of each class, as well as the second series of the third class, are fired at the "Strich-Scheibe." This firing also is carried on at short range (110 yards) and from a rest.

2. The "Infanterie-Scheibe" (Infantry Target) is also 6 feet high by 4 feet wide, and is divided longitudinally into three equal parts, the central one of which (the so-called *man's breadth*) is painted white, the two outer parts being painted blue. The "*man's breadth*" is bisected horizontally by a black line, parallel to which and 24 inches below it is another black line, these two being the upper and lower sides of the (so-called) "oblong." From the point of intersection of its diagonals as centre with radii of 3' 9", 5' 8", and 7' 8", three circles are described, called respectively "Rings" Nos. 3, 2, and 1, the former two being white, the last black. These three "rings" form together what is called the "mirror." The whole target is bisected longitudinally by a black line 1' 9" broad, which is, however, interrupted by the "mirror." At each extremity of this line is an anchor mark to aim at. When the fixed back-sight is used the target is so placed that the mirror is in

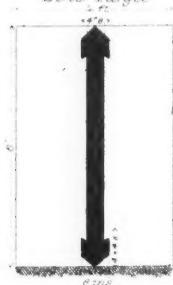


TARGETS USED IN THE GERMAN ARMY.

(Dimensions in English feet & inches).

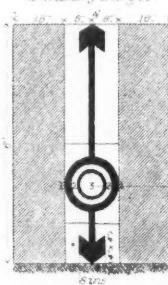
No. I.

Line Target



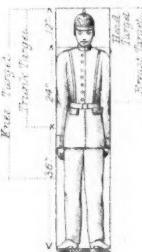
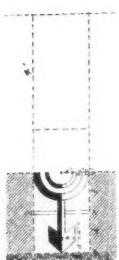
No. II.

Infantry Target



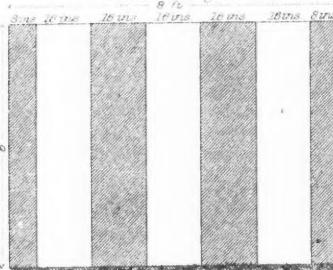
No. III.

Figure Target



No. IV.

Section Target



its lower portion. When the lower flap of back-sight is used the target is reversed.

This target is used up to 275 yards, and more frequently than any of the other targets (in 17 out of the 38 series into which the "firing-drill" (Schul-Schiessen) of the three classes is divided). The conditions which the firer has to satisfy vary very much in the different series. A certain fixed number of "man's breadths," "oblongs," and "mirrors" must be made.

For certain practices the target must be movable. For this purpose two earth epaulements are constructed on each range about 11 or 13 yards from one another with a ditch 40 inches deep, at the bottom of which are wooden rails, along which a little wagon carrying a No. 2 target can be made to move backwards and forwards by means of ropes wound round a roller. The target is made to move at the rate of 96 paces in the minute, that is to say, at the usual rate of a man's walking. The firer stands at the ready waiting for the appearance of the target, which he must hit while crossing the range. If he does not shoot soon enough it counts as a miss.

3. The "Figure Target" (Figur-Scheibe) is 6 feet high, but only 16 inches wide. The figure of a foot-soldier is painted on it, trousers and accoutrements in black. It is bisected horizontally by a black line, another parallel to it being drawn 23¹/₂ above it. The upper quarter, 17¹/₂ deep, is the "Head Target" (Kopf-Scheibe), the upper third, 23¹/₂ deep, is the "Breast Target," (Brust-Scheibe), the upper half, 3 feet deep, is the "Trunk Target" (Rumpf-Scheibe), the upper two-thirds the "Knee Target" (Knie-Scheibe).

Target No. 3 and its sub-divisions, each of which may be used separately, are used at distances between 165 yards and 275 yards inclusive, and are fired at in various positions. No hits count unless in the *figure*, and in many regiments its outline is cut out clear. This is wise, because at "field-firing" and at the "musketry inspection" the above is the rule.

Target No. 3 and the "Trunk Target" are also used as movable targets in the same manner as described for No. 2 Target.

The "Breast Target" is used as an "Eclipse" target, four of them being fixed perpendicularly on the same horizontal beam between two uprights and made to revolve by means of a system of roller, ropes, and pulleys. This apparatus is placed in a ditch or behind an epaulement, and, the firer being ready, the instructor makes a signal and the target appears, remaining visible as long as it would take a man to march twelve paces in ordinary quick time. The shot must be fired before the target has disappeared or it counts as a miss.

4. The "Section Target" (Sections-Scheibe) is 6 feet high and 8 feet wide, and is divided longitudinally into seven compartments, four of which, including the two outer (which latter are only half the width of the other five) are coloured blue, the remaining three being white. Hits are of the same value on all parts of this target, which is used at the longer distances.

Each battalion receives 360 marks (18*l.*) a year for the purchase and maintenance of its targets, which may be either of wood or of canvas; iron frames are not allowed on account of the risk to the marksmen from splashes.

The object of "Field-firing" practice is to give men an idea of the conditions under which firing must be carried on in war, that is to say, on various kinds of ground and at unknown distances. All three classes take part in it. It is divided into two exercises: individual firing, and firing in bodies, ten rounds a head being allowed for the first and twenty rounds for the second. The ordinary practice grounds not being generally suited to the purpose, either as to shape or dimensions, sites specially adapted to it are chosen. The following are the regulations as to "Field-firing" given in the "Schiess-Instruktion für die Infanterie." (Pages 35, 36).

*A.—Individual Firing.**(Einzel Schiessen.)*

After the individual soldier has attained the requisite degree of skill in the use of firearms by his practice in shooting drill (*Schul-Schiessen*), he will be trained to making the most of them when thrown upon his own resources under conditions similar to those of actual warfare.

The special capabilities which these exercises are intended to develop are skill in making good practical use of the ground for cover and for giving support to the arm when firing, accuracy of aim, and in judging distance, choice of the right sight, correct judgment of the allowance to be made according to circumstances, and of how to take the best advantage of the limited periods of time during which the mark is visible.

Practice is, therefore, carried on as far as possible at unknown distances and with frequent changes of ground, still at such distances that every shot may reasonably be expected to be a hit,¹ various targets being used: the "Figure," "Head," "Breast," "Trunk," and "Knee" targets. As a rule men shoot one after the other, so that thorough instruction in every detail and complete control may be possible.

Subaltern Officers, non-commissioned officers, and privates, of all three classes take part in these practices.

*B.—Firing in Bodies.**(Abtheilungs Schiessen.)*

The object of this exercise is to accustom each man to *fire-discipline*, to practise bodies of men in all the varieties of combat with firearms and to develop and increase the capacity of Officers in controlling the fire of their men.

The last-named object will be furthered if the direction of these exercises is taken in hand by the regimental or battalion Commanding Officers, and if the units employed are made up to the war strength. In order that these exercises may fulfil their object, they must be so arranged as to produce such situations as will most thoroughly test the powers of the leader to fulfil all such requirements as are explained in Appendix H. 2.²

By setting up different kinds of targets at unknown ranges, by varying the amount of time allowed for the deployment of the fighting line, as well as the period during which the mark is to be considered visible or within range, the instructor arrives at developing in the leader quickness and accuracy of eye together with skill, in the men readiness and the power of aiming quickly. As the instruction progresses the firing exercises will be

¹ In the original German text the reader is referred to Appendix H, the subject of which is "General principles for the employment of the Infantry rifle (Mauser, 1871)", and which contains the following passage relative to circumstances under which "every shot may be expected to prove a hit."

Up to 210 yards against individuals lying down, or only half exposed;

Up to 275 yards against marks as broad as a man, and as tall, or half as tall;

Up to from 440 to 495 yards against broader marks of the height of a man, but only up to 385 yards, if these marks are only of half a man's height.

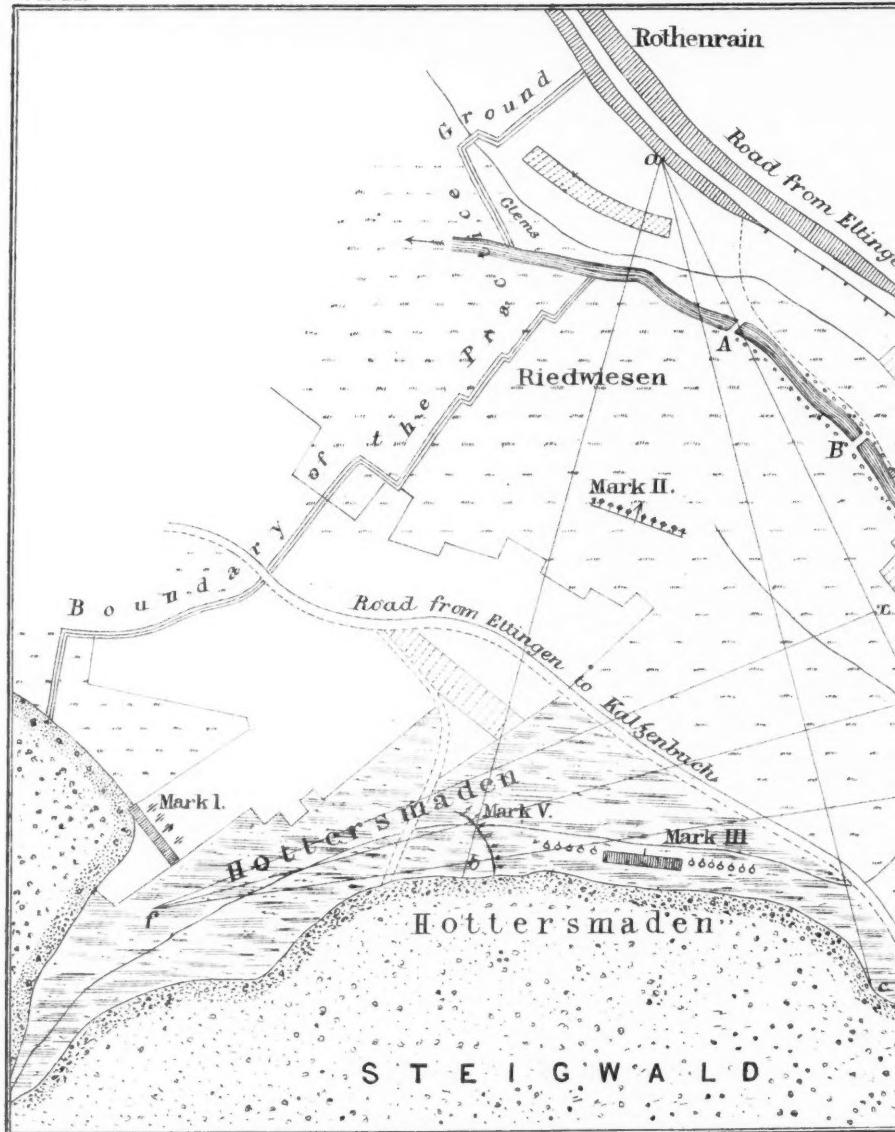
If the range is known, and the corresponding sights are used, the last-named limits may be extended respectively to 715 and 495 yards.

Beyond these limits no effective practice can be reckoned upon, unless carried on simultaneously by a considerable number of riflemen aiming at the same mark.

² The interesting chapter referred to (pages 71–76 of the "Schiess-Instruktion") treats of the "Control of Fire," or "Leading of troops under Fire" (Feuer-Leitung).—L. G.



PLAN OF THE PRACTICE GROUND.



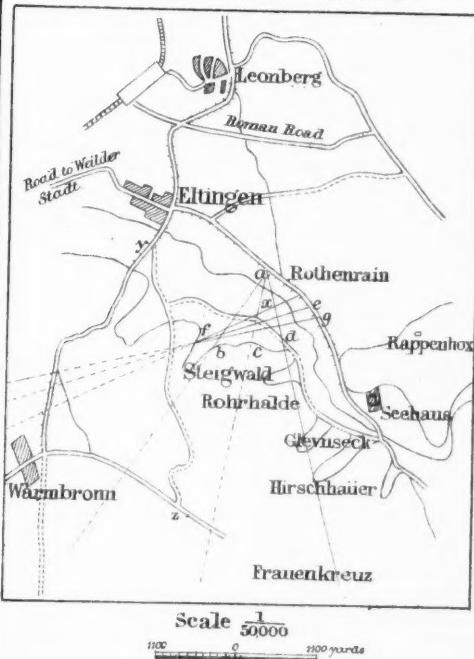
Scale = $\frac{1}{6250}$

Cultivation.

0 55 110 165 220 275 330 385 440 495 550 yard



GENERAL MAP OF THE ENVIRONS.



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conducted so as to carry out simple tactical ideas, and the result will be practice in battle tactics, in the execution of which the course of musketry instruction will reach its furthest point as far as the men as a body are concerned.

We have already said that 130 rounds per man are allowed for the annual course. The Captain must set aside a part of the ammunition which remains over—after going through the course of "Shooting-drill" (in which the expenditure of ammunition depends to a certain extent upon circumstances) and after expending 30 rounds per man in "Field-firings" for "Practice for Instruction," the supply for this purpose, and for extra practice when required by bad shots, being supplemented by the ammunition received in return for old lead.

It is not possible to find at every station a site for carrying out "Field-firing" on the more extended scale referred to in the last passage quoted from the German Regulations, but this is done wherever suitable ground is available. The following extracts from an article in No. 515 of the "Revue Militaire de l'Etranger," give a good idea of the careful manner in which this, as well as every other part of a soldier's training, is carried out in Germany.

*Exercises in "Field-firing," with the Application of a Tactical Idea.
(See accompanying Maps.)*

The five infantry battalions quartered at Stuttgart were fortunate enough in 1880, to be able to make use of a piece of ground suitable for carrying out all the measures prescribed by regulation for the complete execution of "Field-firing" in bodies.

The Militär-Wochenblatt, of the 21st August, 1880, published an account of exercises of this nature, as performed on the 19th July, 1880, by the 2nd Battalion of the 125th Regiment. We reproduce this account *in extenso*, adding two sketches taken from the plans which accompanied the original article, the first of which is a general map of the environs of the scene of operations, the second representing on a larger scale the practice ground itself, and showing the position of the targets.

The five infantry battalions quartered at Stuttgart have had the opportunity this year of practising "Field-firing" in bodies on ground of such a nature as to enable them to fulfil the conditions enumerated in the musketry regulations more completely than has been the case in previous years.

The commune of Eltingen, in the district of Leonberg, had let a field to the garrison for the whole period of "Field-firing" practice. This field is situated in the valley of the Glems, the part of it on the right of this stream being very narrow, whilst that on its left bank is wider, slightly undulating and backed by a wooded slope which formed an excellent butt. The ground on the left bank affords room for various deployments, and, if the re-entering angle of the wood (Hottersmaden) is made use of for long range targets, admits of firing if not at all distances at least within the limits at which bodies of troops may fire with advantage at every sort of mark, that is to say, up to 770 yards, which may be considered the extreme point up to which the field of the most telling fire extends, particularly for troops practising with a limited number of cartridges. The position of the village of Eltingen and of the farm of Seehaus is such that it was not possible to fire along the valley and thus to make use of the greatest extent of range, and, moreover, for reasons which hold good in ordinary times, the Glems Brook could only be crossed at the points A, B, C, where the pioneers made temporary bridges.

On the 19th July, the 2nd Battalion of the 125th Regiment, formed in two companies made up nearly to the war strength, marched out of garrison at

5 A.M. In order to reach the practice ground it had to march for three hours without any halts, the men being in complete marching order. This was a fair representation of the state of things which would exist on actual service, and served therefore as a good preparation for the "field-firing" practice which was to follow and which was so planned as to represent, first, an offensive, then a defensive engagement which the two companies made up to the war strength had to execute in succession, whilst the one, for the time not directly engaged, represented the reserve, and thus performed its part without any expenditure of ammunition.

All the targets were put up before the commencement of the practice. "Eclipse," targets could not be used, as according to the terms of the agreement made with the Commune of Eltingen, it was not allowable to dig any ditches or trenches. The mark to be fired at was pointed out and the time during which it was supposed to remain visible was made known on each different occasion by the regimental Commanding Officer who directed the exercise, or else the periods of supposed visibility were indicated by signals agreed upon beforehand, such as musket or cannon shots.

The practice commenced at about 9 A.M. by working out the following idea of an offensive movement :

"A company, numbering 180 rifles, forms the flanking detachment of a column which is marching from Stuttgart on Leonberg by way of Solitude; having reached the Valley of Glems half way between Seehaus and Eltingen "it comes into contact with the enemy, whom it endeavours to drive back towards the south."

The detachment was marching on the road leading from Seehaus to Eltingen along the right side of the valley when it received the following notice : "Some parties of the enemy are visible on the border of the wood "beyond the stream." The company immediately extended its leading division as advanced guard facing the point A.¹

This demonstration was replied to by some cannon shots fired from the valley which forms a re-entering angle in the wood, and goes by the name of Hottersmaden. The two divisions of the main body then moved at the double to the edge of the embankment, along which runs the Rothenrain road, and which forms a good shooting position, faced the wood and replied to the enemy with an intermittent skirmishing fire directed on Mark I, representing four field pieces with horses and gun detachments at 880 yards' distance. Two sights were used and the distance estimated with the naked eye. During this little action the firing was, it is true, all on one side, but only seven rounds per man were expended, and, as was afterwards found, nearly all the gun detachment were disabled. The advanced guard division now moved up to the right and crossed the bridge A, lower down the stream, after which it extended along a fold of the ground on the other side, and covered the passage of the other divisions with a heavy skirmishing fire directed on the enemy's skirmishers, who were supposed to be advancing on the stream, and were represented by Mark II, formed by 35 "trunk targets," and 35 "knee targets" at 275 yards' distance. The second division meanwhile crossed the bridge at A, prolonged the line of the first division to the right, and carried it along by the example of its own dash up to within 200 yards of the mark, from which point the fire was maintained, becoming from that moment overwhelming. The enemy did not await the coming attack, but withdrew towards the forest, taking ground a little to the right. The third division having crossed the brook at the bridge B, higher up, kept up a skirmishing fire on the retreating enemy.

This change in the situation was indicated by the Commanding Officer's

¹ In this description the word "division" is meant to express "zug," the third part of a Germany company when formed two deep.—L. G.

ordering the fire directed against Mark II to cease, and by his pointing out Mark III as meant to represent the repulsed enemy.

The two divisions of skirmishers on the right now closed into column, and followed the remainder of the fighting line by obliquing to the left. Mark II had 37 per cent. hits in the trunk targets, and 52 per cent. in the knee targets.

Mark III, consisting of eight "section targets," with 30 "figure targets" in the intervals, represented the enemy who had rallied on the border of the forest. Received by a superior fire denoted by some musket shots, the division of skirmishers which was pursuing the enemy retired hastily, but was soon rallied by the advancing support, which, extending a division on its right and bringing along with it on its left the skirmishers who had just given way, renewed the combat.

There were fired altogether at Mark III, with the 460 yards' sight, four volleys from the division in close order, supported by the fire of the nearest skirmishers, and there were also from the same troops two periods of skirmishing fire, the formation being the same as that represented by the mark, and the result being 70 per cent. hits in the "section targets," and 24 per cent. in the "figure targets."

The enemy disappearing in the forest, the Commanding Officer, according to agreement, ordered the fire against Mark III to cease, the company resumed its march, one of its divisions joining the fighting line, whilst the other two followed in support, overlapping each flank, and keeping pretty close up to the front. The signal "Alarm" announced a cavalry attack on the left flank, which was denoted by Mark IV, consisting of 14 targets close together, representing horsemen. Whilst the left supporting division wheeled up and prepared to fire, the skirmishers closed, and the right support made ready, turning to the new front.

Four division volleys were fired, producing 33 per cent. hits. The enemy was 275 yards distant, notwithstanding which the 440 yards' sight (the one for cavalry) was used, and the firing was too high. All things considered, it would be better to sanction the use of the lower flap against cavalry as well as infantry.¹

After the repulse of the cavalry, and after the advance on the wood had been renewed, the company encountered a hot slanting fire from the right (indicated by a volley) which proceeded from a line of the enemy's skirmishers lying down, and represented by Mark V (40 "head-targets," and 40 "breast targets.") The enemy occupied a commanding position at the mouth of the re-entering angle formed by the border of the wood in the valley of Hottersmaden, where the land begins to rise. The two divisions pushed on by successive rushes up to the road which runs along the border of the wood, and to the rising ground occupied by the enemy, thus arriving within about 130 yards of the latter, that is to say, at the last stage of fire.

The nature of the forest being unfavourable to a real turning movement, the support advanced in the group formation, marched straight on the fighting line, with drums beating, and carried it on to the assault. The reserve company, which had meanwhile deployed, followed this movement, also with drums beating. The decisive stage of the attack was thus represented, all the disposable force being concentrated on the same point.

Twenty-six per cent. of the shots fired struck the mark, more than two-thirds of the targets being hit. The fire brought to bear by the assailants

¹ The lower flap, and the 440 yards' sight, are the only sights to use against cavalry at the ranges of 385 yards and 440 yards respectively. The lower flap is also employed in firing on men standing up without cover up to 396 yards, and against wider marks, though of only half the height of men, between 297 yards and 385 yards. (Note of the "Revue Militaire.")

was, therefore, sufficiently effective as a preparation for the actual assault. It is true, however, that he had it all his own way, there being, of course, no reply on the part of the defender, and, moreover, that at last he was firing from a point so near the enemy that it would have been impossible for him to have halted there in actual battle.

The theme of an offensive action was thus completely worked out, and the enemy may be considered as driven from the field.

The company had passed through all the essential periods of an offensive action with firearms up to the actual assault, commencing by replying to the enemy's artillery at the extreme effective range of the rifle, then taking advantage of the cover to its front, so as to reach rapidly the most effective ranges, whence it carried on the combat with every kind of fire, directing it at cavalry as well as at every other description of troops which came into play at different points of the battle-field.

The interest in the result of their efforts which drew the men on towards the targets, so as to ascertain the effect produced upon them, represented the offensive impulse which in actual conflict should make the assailant dash on from the point where the actual assault commences right up to the enemy's line.

After all the targets had been examined and repaired the defensive manœuvre representing a retreating action commenced. It was executed by the other company.

The same marks were used, but the uncertainty, the realism, the means for keeping the attention fixed, were all preserved, thanks to the latitude left to the director of the manœuvre as to regulating the mode of employing the different marks and their successive appearances, as to keeping them at distances unknown to the troops engaged, and to determining each time the duration of fire. The following theme was worked out during the second part of the manœuvre.

"The company is acting as a flanking detachment to a column which is "retiring from Weil der Stadt on Leonberg ; it will arrest the pursuit of the "enemy for about an hour in the valley of the Glems."

The action was recommenced from the moment when the first act had come to an end, the most interesting and critical period being when the company was driven back under an overwhelming fire indicated by some musket shots, after having repulsed a charge of cavalry to within a short distance of the Glems, where it had the defile directly in its rear. After crossing by successive divisions the bridge B up stream, the main body of the company succeeded, thanks to the screen afforded by the bushes on the river-bank, in gaining a commanding position favourable for defence ; this position is above the Rothenrain road on the crest of the steep bank which overlooks the bottom of the meadow. The skirmishing division had remained on the other side of the Glems, posted between the two bridges, and only succeeded with difficulty in holding in check the enemy's skirmishers who were pushing forward, being represented by Mark II, situated at point blank distance from the rivulet.

After making a quick offensive return to gain room in front of the bridge, this last division at length succeeded in passing the defile A by successive fractions, and, taking post as the right échelon of the company, covered the bridge with its fire. The manœuvre came to a conclusion at about midday by firing volleys at the battery in action near the forest (Mark I at about 880 yards' distance) then by retiring on Eltingen in a north-westerly direction in the formation customary in the field under such conditions.

The effects of the fire were about the same as those obtained during the offensive action, only that in the case of that directed on Mark III (representing a company deployed with one division in close order, and the other two extended as skirmishers on each flank), the percentage of hits was only about

half that made by the other company (13 against 24). This was probably due to the fact that, for the purpose of trying an experiment by way of comparison, the whole of the skirmishers, instead of those only who were nearest to the centre divisions, were ordered to join in the volleys fired by the latter. The following are the general results obtained during the two manoeuvres :-

Hits on the "figure targets," and on the various forms thereof ("head," "breast," "trunk," and "knee" targets), 29 per cent. at distances under 495 yards.

Hits on the mark formed by composite targets ("section" and "cavalry" targets), 49 per cent. Hits on the marks representing a battery at about 770 yards (the boundary line between the middle and long ranges), 10 per cent.

The greatest number of hits were made at the practice between 198 yards and 275 yards on "knee" targets, that is to say, 52 per cent.

It is very certain that results such as these, obtained as they were in peace time, would be much reduced on actual service, although pains were taken to place the troops engaged in the exercises just described in situations approaching reality; on the other hand, it is also very certain that the training thus given to soldiers, and the skill arising from it, will produce a great effect in battle. Let us remember that to that saying of Napoleon, which is so true, "Fire is everything, the rest is but of small account," should be added the following one, "Le moral est pour trois quarts."¹

In conclusion, we will add a few general remarks. One essential condition must be kept in view in all field firing exercises if we wish them to be really instructive, and not to give those who take part in them false ideas, and that is that no attempt should be made to increase the percentage of hits by departing from a truthful representation of war.

The different periods of the tactical operation must be kept well in keeping with the technical execution of the firing.

The value of the exercises will be all the greater when the fighting line, in its advance or retreat to place itself in front of the different marks, regulates its movements in such a fashion that the general result is a manoeuvre perfectly understood by all and one which brings out clearly the effect which may be produced by troops on the war footing when they use ball cartridge.

It is necessary that the mode in which the different grades, from the company commander down to the group leader, exercise their authority in directing the fire of their men, should be strictly defined, in short, that what we shall call the mechanism of the company's fire be carefully regulated; and it is, therefore, indispensable that with this object in view very precise instructions should be given, and the limits of each leader's sphere be clearly traced. We must deal with this matter at our daily drills and exercises, in the conscientious manner which is characteristic of our nation; by no other means shall we arrive at making our fire effective.

We may assume when, notwithstanding the effect of deviation to the right, consequent upon the construction of our rifle, the hits are distributed equally along the whole front of the mark, that the fire has been well directed, and that the points to aim at have been judiciously assigned to the different parts of the firing line. The effects produced by occasional bullets ricochetting on the meadow, whose soil is generally very wet, and therefore unfavourable for observing where the shots strike, but which was on this occasion in an exceedingly good condition for the purpose, in consequence of the high temperature of an exceptionally dry season, proved the wisdom of the recommendation to try, at any rate, at the middle distances to regulate the sighting by means of experimental volleys.

The rule which we take such pains to impress upon the skirmisher, not to

¹ Translation would only spoil this saying.

fire as long as the object aimed at is masked by smoke, causes the periods of skirmishing fire, limited to two or three rounds, to be inconveniently prolonged, and, in consequence, the short intervals during which the targets are clear are not taken advantage of.

It is not advisable to make the firer too timid and hesitating, but, on the contrary, he should be brought to consider the smoke produced by a period of firing as an inconvenience which he must make the best of, and his eye must be accustomed to penetrate this veil.

It might, perhaps, be useful to fix the duration of these periods of firing, that is to say, to name the average time allowable for expending two or three rounds in skirmishing fire.

Officers also would do well not to insist systematically upon a pause after each round, with a view to controlling the fire of their men. All who took part in these exercises were convinced of their extreme importance, especially to Officers whose duty it will be to direct firing in battle.

A general wish was also expressed for having ground set apart for such exercises, where practice may be carried on at the middle distances, from 770 to 500 yards, against targets representing bodies of infantry.

No one doubted the importance of familiarising all hands more and more with the practical application of our fire tactics which are still of such recent date.

It is certainly the case that these manœuvres are executed under conditions approaching those of actual warfare, but it is also very evident that they must be kept within very narrow limits and therefore only serve to teach us how to employ in a rational manner a given number of cartridges.

It is by manœuvres performed in a conscientious manner against a marked enemy with blank cartridge by bodies of troops raised for the purpose to the war strength, and also by an exhaustive study of the book of musketry instruction of which our infantry may be as proud as of an actual victory, that we shall be able to approach the goal which we are striving to reach.

Belehrungs-Schiessen (Firing for Instruction).

The object of this branch of the annual course is to make the men acquainted with all the properties and the full value of the weapon with which they are armed. Only first class shots fire, the men of the other classes, however, attending to watch the effects and to gain instruction.

The extent of the practice and the mode of operation depend upon the amount of ammunition saved by the companies from their annual allowance. Battalion and Regimental Commanding Officers are recommended to take this branch of the course into their own hands, so as to make the most of the, possibly, small means available, by bringing together the different companies with a portion of their united savings in ammunition and with their materials for target practice.

The object of these exercises being, as before said, to demonstrate the peculiarities and power of the arm, care is taken that they are conducted under the most favourable circumstances possible, therefore, as a rule, at known distances and in good weather. The men wear their easiest clothes, and fire, whenever desirable, from a rest.

The following examples are given of points which it is desired to impress upon the soldier by means of these exercises.

A.—The degree of Accuracy to be expected from the Individual Rifle under various circumstances.

This is demonstrated as follows :—

- 1. A good marksman sits at a table resting his rifle upon it, and fires 25 shots at each of the following distances, 220, 330, and 440 yards, then 45

shots at 660 yards, one "section target" being used for the three former ranges, and two of the same targets together for the last-named range.

The effects being carefully noted, the soldier can form an idea of the limits within which individual fire may be expected to prove effective.

2. A good marksman, under the same circumstances as before, fires five shots at each of the following distances, a different target being used for each: with fixed back-sight at 55, 110, 165, 220, 275, 297 yards; with the lower flap at 55, 110, 165, 220, 275, 330, 385 yards; with the 440 yards' sight, at 110, 165, 220, 275, 330, 385, 440 yards. The "infantry target" is used, except when firing with the 440 yards' sight, when the "section target" is used.

The central point of the hits is marked conspicuously on all the targets, which are then placed behind one another at their respective ranges, and the comparative effects of the firing with the different sights are studied, various supplementary means being used to assist in the demonstration.

3. A marksman fires seven shots at 220 yards with bayonet fixed, and the same without it, and is then made to remark the deviation and difference of elevation produced in the former case.

B.—The Result to be expected from the firing of Bodies of Men.

1. From 10 to 25 men fire lying down, and with a rest, at a mark composed of from six to eight "section targets," using the 660 yards' sight, 100 shots at each of the ranges 704, 682, 660, 633, 616, and 594 yards. The hits are counted each time, ricochets not included. The examination of the targets leads to a clear conception of the area covered by the fire of a body of men of the strength employed at the different ranges and of the comparative degree of security under such a fire enjoyed by men standing up, kneeling or lying down, in close order or extended. Experiments may also be made at the same time in combining the simultaneous use of two or more sights by a body of men. The same practice may be repeated at all or any ranges, and the comparative effects of skirmishing and volley firing may be noted.

2. A series of long targets are placed behind one another at such distances that a shot clearing the top of one will hit the bottom of the next one. For shooting with one sight, a total depth of 165 yards is sufficient, whereas if two sights are used, this total must be increased to 330 yards.

From 10 to 25 men fire a hundred or more shots lying down and with a rest. The experiment may be tried at all the different ranges with the use of a single sight or the combination of two or more sights. This practice is virtually an extension of the one last noticed, and as owing to the arrangement of the targets no shots should pass unobserved, the effects of the firing will be better seen, and therefore *more instructive*.

The party under instruction may in all cases compare the results of their practice with those shown in the tables given in the Appendix to the Musketry Instruction.

Musketry Inspection.

These inspections are, like everything else in the German Army, conducted in a thoroughly practical manner.

They are made, as a rule, by Regimental Commanding Officers, except in the Guards, whose greater concentration admits of the duty being performed by the Brigadiers.

The time for these inspections is before the commencement of the autumnal exercises. The programme for them is changed every year and is issued by the Minister of War, having been generally prepared at the School of Musketry. After approval by the Minister a sufficient number of copies are lithographed for distribution to the whole of the infantry, together with the forms which have to be filled up. These papers are sent under seal to the

different regiments and kept secret until the actual day of the inspection. They are only communicated to the company commanders when actually on the ranges, the only thing made known beforehand, and that for the purpose of preventing delay, being the kind of target required. This system is adopted for the purpose of preventing "cramming," and to ensure all branches of the Musketry Instruction being cultivated with equal care. It also gives the Inspecting Officer the opportunity of judging each regiment upon its merits, no previous rehearsal being possible. The inspection is always made under the best possible conditions as regards weather and situation, so that the estimate of relative efficiency may be as fair as possible. The results of each inspection are recorded in duplicate, one copy being furnished to the Emperor, the other to the Corps-Commander, who forwards it to the Minister of War, in whose office a general musketry report for the whole of the infantry is drawn up annually from the regimental returns and the inspection reports. The requisite number of rounds for the inspection are issued annually in excess of the regular regimental allowance.

The following example of an inspection programme is given by Baron Kaulbars.

PROGRAMME OF THE MUSKETRY INSPECTION OF NO. REGIMENT IN 1875.

L.—Individual Firing.

1st Test.

The 20 best shots of each company, selected by the Captain without regard to class, will fire at target No. 3. Range 440 yards.

Each man to fire five rounds lying down, his rifle resting on a hillock 12 inches high.

2nd Test.

The 20 next best shots of each company, selected as before, will fire at Target No. 1 standing up, and with free arm. Range 220 yards. Five rounds per man.

3rd Test.

Twenty second class shots, picked out by the Inspecting Officer, will each fire five rounds standing, and from a rest at 220 yards.

Test for non-commissioned Officers.

The Inspecting Officer will select six non-commissioned officers per company, each of whom will carry on standing up, and with free arm, rapid independent firing for one minute at Target No. 3. Range 275 yards. The firer to take the cartridges from his pouch which will be opened and the rifle at the ready before the firing begins. Each man's hits are marked as soon as he has fired his rounds.

II.—Firing in Bodies.

The best shots of each company are formed two deep, in three divisions each of 15 files. The first division, composed of the best shots, will perform Practice E, the other two Practice D. Each man to fire five rounds, the time elapsing between the first and last shot being noted.

Practice D.

The mark is made up of 24 "figure targets" cut out and representing a chain of skirmishers standing up in line with 8 feet 4 inches interval. Range 308 yards.

A shelter trench is excavated parallel to the line of targets in which the

men of the two divisions settle themselves, resting their rifles on the parapet. They remain at the ready and commence firing by word of command.

Practice E.

The mark is composed of 16 "breast targets" cut out and representing a line of skirmishers, at 6 feet 8 inches interval. Fifty-five yards to the rear are placed three targets only one-third of the height of the "figure targets," and representing the supports. The line of skirmishers is 264 yards from the firing party.

Other dispositions are similar to those made for the last practice, except that firing commences without any word of command. It is to be directed entirely on the targets which represent the skirmishers.

Dress.

The tunic is worn in all weathers at target practice. If the cloak is worn the arms are not put through the sleeves. The preliminary exercises of each class are performed in undress uniform, that is to say, in forage caps with accoutrements, without the knapsack. Those, however, who find the sun inconvenient may wear the helmet.

For the remaining exercises of the "shooting drill," for "individual field firing," and for the musketry inspection, the men are in complete marching order, with cloaks slung and knapsacks made up to fifteen pounds' weight. It is left to Commanding Officers to determine the dress to be worn at field firing in bodies, and at the "shooting for instruction."

Prizes and distinctive marks for good shooting are given, as follows:—

Each battalion receives yearly 22 prizes of the total value of 4*l.* 5*s.* 6*d.*, namely:—

Two prizes for the non-commissioned officers of the battalion; one of 9*s.* being competed for by the non-commissioned officers who belong to the special class, one of 4*s.* 6*d.* to be competed for by the non-commissioned officers belonging to the 1st class. For the privates of each company: one prize of 6*s.*; two prizes of 4*s.* 6*d.*; two of 1*s.* 6*d.*; the first of which is given to a 1st class man, the others being divided equally between 2nd and 3rd class men.

Should no men of a class qualify for a prize allotted to it, the same will be available for the next lower class.

This rule applies to non-commissioned officers as well as to privates.

Candidates for the prizes must have performed all the exercises of the class to which they belong in the manner prescribed by regulation and have taken part in individual field-firing. The first prize is given to those who have gone through the principal practice of "shooting drill" with the smallest expenditure of cartridges, or, in case of equality between two competitors, to the one who has scored the most "oblongs," and "figures." Instead of the 9*s.*, 6*s.*, and 4*s.* 6*d.* prizes, silver medals may be given. The marksman's badge is given to the 12 best shots in the 1st class of each company under the same conditions as those which regulate the award of prizes. Should there not be 12 privates in the 1st class, the number may be made up by 2nd class shots who have qualified for promotion to the 1st class. Twelve marksman's badges are also given annually to the best shots amongst the non-commissioned officers provided that their skill with the rifle is not below that of any privates who have not received prizes.

An allowance of 18*l.* per annum is made to each regiment to meet the expenses of target practice.

School of Musketry.

There is a School of Musketry at Spandau, the "Militär-Schiess-Schule," the object of which is: 1st, to make experiments with any new arms which it is

proposed to introduce into the Service ; 2nd, to keep the army acquainted with the systems in force in foreign countries ; 3rd, to train musketry instructors.

The permanent staff of the establishment consists of a director (a field Officer), 13 Officers, a master armourer, a paymaster, 4 company sergeant-majors, and 6 non-commissioned officers, 4 Lieutenant Instructors, and 69 Lieutenants to qualify, with their 73 servants. 138 non-commissioned officers and 274 privates are detached for six months annually to the school from infantry and cavalry regiments ; 17 additional non-commissioned officers and 15 orderlies are also detached for a whole year for the service of the school, as well as the requisite number of drummers, buglers, bandsmen, &c.

As a matter of course, only Officers and men who are likely both to become good Instructors and to remain in the Service are sent to the school.

As there is not room at the same time for representatives of all the infantry and cavalry regiments in the army, they take it by turns, a roster being kept for the purpose.

We have now accompanied the German foot soldier throughout his whole course of tactical training, from the time of his joining as a recruit, with the exception of the last two periods, that of the "autumnal exercises," and the final period of the "autumn manoeuvres." The former, as we have already noticed, consists of a repetition of the regimental and brigade evolutions practised in the spring, their object being to restore, before the commencement of the latter, the steadiness and precision which may have been somewhat impaired during the period of "field service." It is unnecessary to dwell further upon them. To give anything like a fair description of the latter would require more space than can be afforded, nor would it repay the reader, as the main features of these manoeuvres, which have exercised such an important influence on the training of the German army and may be considered as the crowning of the edifice, are well known to military students of this and of all other civilized countries, having been observed by them with interest, and described over and over again by competent critics, having been, moreover, imitated with more or less success by all the great European armies, including our own.

We will now devote a few pages to the regimental training of the Infantry Officer, passing over the education which he receives before joining, an education calculated, as was before remarked, to make him fit for duty from the very first, whilst the tests to which he has to submit before he is admitted to the Service seem well calculated to ensure his fitness for it in every respect. What we will endeavour to show, as briefly as possible, is how his military efficiency is maintained and improved after he has joined his regiment, without, be it remarked, any examinations on promotion, and how the qualities of self-reliance and readiness of resource, so necessary to an Officer, are fostered by the system in force. This must, indeed, have been evident to all who have read the account of how the private soldier is trained, as, in teaching him, the Officer completes his own education ; but it is a point which cannot be too much insisted upon, as from it, perhaps, more than from any other one thing, results the excellent preparation of the German Infantry for battle.

I will again make use largely of Baron Kaulbars' report as rendered by the French translator : Everywhere and always we find the good of the Service superseding all other considerations, hence first and foremost absolute impartiality in the selection of officials whose aptitude for the duties which they are called upon to perform is rigorously insisted upon ; next, full and entire liberty given to each within his own sphere, and consequently complete responsibility.

We have seen elsewhere how this liberty of action is judiciously restrained

within certain limits by the precision with which the different military exercises are distributed throughout the various periods, this distribution being very rarely departed from, and then only for very urgent reasons. The necessary amount of time is allotted to each branch of instruction, the arrangement being the result of long experience, and being always strictly adhered to. Everyone, from the Emperor downwards, makes it his first care never to interrupt nor to disturb the regular progress of instruction. A remarkable proof of this was given in the spring of 1875, when a grand review took place in honour of the King of Sweden. The only troops which took part in it were those of the garrison of Berlin, not one of the regiments quartered in the neighbourhood being brought up for the occasion, the Emperor considering that they could not at that season of the year lose, without serious inconvenience, the two days which they would occupy in marching to and fro, and which would have to be taken from their drill, particularly as this was the period of the squadron and company inspections.

Now the natural series of these inspections must not on any account be disturbed, as each of them marks the completion of one of the periods of instruction, and must take place at the same date for all those concerned. For it would be thought unjust to inspect one regiment rather than another, and to advance, even by so little as a week, the day named for this operation.

In consequence of the religious respect which all, high and low, profess for the strict observance of these details, no modification is allowed unless under very exceptional circumstances, and the progress of regimental instruction is just as regular as in a public school. I would go so far as to compare a Prussian regiment to a piece of clockwork, which has been going for many years, and which is wound up regularly once a year, and always at the same time, in autumn. According to the requirements of the season, the temperature, &c., the machine is regulated, that is to say, by shortening or lengthening the pendulum you make it go quicker or slower, but it is never allowed to stop. *Individual initiative* is the *spring*, always ready to give the movement, which the *inspections* regularise at equal intervals like the strokes of the *pendulum*.

But the authorities content themselves with marking out in a general manner the great lines of work, and with fixing the duration of the different periods. The executive Officers have then to regulate the employment of the time by the day and by the hour.

The men are divided into classes, in each of which instruction is carried on in an extremely methodical manner. Experienced Officers direct the general progress of the course and see that each moment is properly utilized, adding or retrenching according to circumstances and to results obtained. The great independence allowed to Officers with regard to the instruction of their men causes a regular struggle amongst them for progress. Thus, for instance, Captains commanding companies and squadrons, as well as Lieutenants in charge of recruits or of volunteers, make every effort, both physical and intellectual, to invent some system or method of instruction calculated to produce the best possible results. There is a sort of perpetual competition amongst these Officers; each vies with the other and endeavours to prove to his colleagues as well as to his superiors, by the results obtained, the excellence of the method which he has adopted.

In consequence of this there is no doubt often a very remarkable difference between the systems adopted by companies of the same battalion, but the Commanding Officer watches and compares their progress with all the more interest, knowing well that when the day of inspection comes he will be able to correct any errors, and be only impatient to judge for himself from the final result, of the relative merit of the systems pursued.

I cannot help, with reference to this, relating the following anecdote, as it will give a good idea of the relations between superior Officers and those

below them. I heard a General one day expressing to one of the Captains under his command his astonishment at the method which the latter was following in instructing his company.

"I assure you, you will never do any good in this way, Captain," he was saying. I made it my business from that day not to lose sight of the company in question, and remarked that during the next four weeks the Captain went on in exactly the same way without the least hesitation. The inspection day came. The General was present. The Colonel found our Captain's men perfectly well trained, and complimented him upon it warmly. I then saw the General go up to him in his turn, and heard him say before everyone, "Well, Captain, I must confess that you have beaten me after all, and although certain little things might have been done differently, I never should have expected to see such good results as you have obtained." He then congratulated the Captain cordially, and, turning round to us, added, "This proves, gentlemen, that every one has something to learn, however old he may be."

It is easy to understand what an excellent impression such conduct must make on Officers and how well calculated it is to develop zeal and initiative even in individuals not naturally gifted with those qualities, and this liberty of action contributes in a great measure to the high standard of professional instruction amongst Officers of all ranks, for being, as it were, in the first instance forced to love their profession, they end by taking an interest in it of their own accord, and soon strive to succeed not only as well, but even better than their predecessors or contemporaries. Moreover, the interest which Officers take in their profession soon goes beyond the narrow limits of their regiment. The very initiative which is allowed leads them to turn their attention to what is done by other corps and by other arms of the service, and as their horizon gradually widens more and more, there is soon no military question which does not excite their eager attention; indeed, it often happens that the ordinary drills of some company or squadron attract day by day numbers of Officers of all arms, of the Staff, and even of the War Office, who come to look on merely because they hear that Captain So-and-So is trying some peculiar system. All the lookers on take the most lively interest in the performance, everyone gives his opinion, and an animated discussion soon arises.

If you only happen to be at Berlin during the period of spring drill and of inspections, you cannot help being struck by the crowd of Officers of all arms, and even of military officials of all kinds, whom one meets in the morning at the "Thiergarten," and in the streets. Where are all these people 'going?' one naturally asks; the answer is very simple. All, with but few exceptions, are going to one or other of the parade grounds to see a manœuvre, an inspection, or something of the sort. And who are these mounted Officers at six or seven o'clock in the morning? They are not only regimental but Staff and Commissariat Officers, Engineers, professors of the War Academy, and of the Military Schools, &c. Here comes a General alone, or accompanied by an aide-de-camp; on nearer approach, you recognize one of the highest dignitaries in the army. He also is on his way to the Tempelhof to see the troops manœuvre.

* * * * *

Another little trait. One day I was returning from Spandau with a General, and we were riding along side by side and talking of one thing and another, when I remarked two infantry Lieutenants trotting after us at such a pace that they would soon overtake us. But when on the point of doing so the two young gentlemen pulled up into a walk and kept some little way behind us. The General turned round to them and said, "Pray go on, 'gentlemen.' The two Officers saluted, and galloping by us, were soon out of sight. But they would not have taken the liberty of passing their

superior had they not been invited to do so, for everything in this Service is conducted according to the strictest rules of subordination and propriety. Everyone submits to the discipline, everyone exacts it, and no one is offended or annoyed by it. The inferior hastens to render to his superior the honours which are his due, the latter, on the other hand, takes care to put the former at his ease, and to spare him all embarrassment and restraint.

On both sides there is the conviction that the proper respect for military rank should be maintained in all places and under all circumstances, even with regard to the minutest details, and that this is an essential condition of a well-organized military system.

The relations between individuals in the Prussian Army in matters of duty are based above all upon the mutual esteem which exists amongst them, and which makes them ready on all occasions to support one another, but in no way affects the respect paid to the personal dignity of all.

And if, notwithstanding the perfect ease which pervades their intercourse with one another, the spirit of subordination is manifested with extreme strictness on all occasions, both by words and acts, you never witness the sad spectacle of an inferior trembling before his chief. The youngest Officer, the private soldier if questioned by some high personage, even by the Emperor himself, will reply with self-possession and without being in the least put out.¹ This ease, combined as it is so happily with absolute respect for rank, always creates an excellent impression, all the more because it is direct evidence of the existence of the idea which pervades all, that *the Officer's uniform is of itself a sure guarantee, because no one can gain the right of wearing it without having given proof of real merit.*

* * * * *

Having described how the system in force in the German Army influences the *morale* and affects the relations of Officers with one another, the author proceeds to give an account of the manner in which their intellectual qualities are developed, and their professional education carried on. He commences with a few remarks applicable to Officers of all arms.

"In this matter, as in everything else, we find a methodical organization "sanctioned by the experience of many years, and based upon the sound "principle that *we must only teach in peace what will be really useful in war.*"

We find here again the same idea which appears as the ruling principle in all the details of instruction, whether of individuals or of bodies, and we shall now see it brought into evidence more than ever in the studies and exercises of the Officers.

"To understand one's profession," say the Prussians, "it is not enough to "have gone through even with credit the whole course of the Cadet school, or to "have passed the Officer's examination even brilliantly." Having done this, a young Officer has merely got a good foundation for his future studies, something which will enable him to complete his own education, which really is carried on throughout the whole of his military career. Besides it is necessary for an Officer to be constantly at work, not only to extend and perfect the knowledge which he has acquired before entering the Service, but also so as not to forget what he has learnt, for, as will be generally admitted, if this knowledge is necessary it is so not only up to the day of his appointment but still more afterwards when he is actually in the Service.

Yet we all know how easily a young man forgets in a few years the greater part of what he has learnt, if after joining his regiment he does not keep up and increase his store of science by constant application. It does not do to depend in this matter on each man's personal zeal, hence the necessity of taking measures to ensure the desired result. With this object in view, the

¹ The author dwells very much upon this peculiarity, as may be noticed. Perhaps it would strike a Russian more than it would an Englishman. Still it is well worth noting.—L. G.

higher authorities have taken great pains in providing work for the Officers, and now every regiment has become a sort of permanent school, where they constantly study and discuss all the military questions with which they are bound to be acquainted.

First of all the Officer who has charge of the recruits of his company or of the volunteers of the regiment, or of theoretical instruction, or of gymnastics, &c., is obliged to prepare himself by serious study for the mission confided to him; but, besides this, every Officer has annually to work out all sorts of military problems both in the field and on the map, and to write an essay on some given subject. I say *every* Officer, because although these essays are only required of Lieutenants, the subjects are chosen, and the papers themselves are criticized by the higher Officers, who are thus obliged to study them deeply. For their task is not confined to a more or less nominal supervision of the work of their subordinates, they have to write a detailed critique of it, and to state their opinion of the manner in which each man's work has been done. Hence they have to study the subjects more thoroughly even than their inferiors, and whilst the Lieutenant has only one treatise to write and two or three problems to work out, the field Officer must go through the work of all the Lieutenants in his battalion.

We shall now treat of the Infantry in particular.

The instruction of his Lieutenants is considered one of the chief duties of the Captain. He alone can put them in the right way, can make them understand and love their duty, prepare them, in short, for becoming in time good Commanders of companies. This is, indeed, an inevitable consequence of the ideas prevalent in the Prussian Army with regard to the relations which should subsist between the Commander of the company, of the battalion, and of the regiment. The former, as we know, enjoys complete liberty and has full power to regulate after his fashion the way in which his subalterns carry on their duties. The battalion Commander, and, *à fortiori*, the regimental Commander, are too much separated from the Lieutenants to exercise immediate and constant control over them. This is especially the case with regard to the first elements of military education which they must acquire within the company. Who else better than their Captain, indeed, can point out to these young gentlemen the rules to be followed in training recruits, for instance, and who can better instil into them the principles in force on that subject? The Captain sees that the subalterns to whom he has entrusted any tasks neglect no means available for qualifying themselves to perform them properly and that they have a perfect acquaintance with all regulations affecting the matter. He practises them in the command of small detachments and directs them in the performance of all the details of field duty, such as making little reconnaissances, establishing advanced posts, &c. It is also for him to superintend them when giving theoretical instruction, and to call their attention to any weak points in their own education, aiding them with his counsels, showing them how to set about their work, and why one method is preferable to another. The Officers to whom gymnastic instruction is entrusted are besides placed for this special branch under the direction of one of the Lieutenants who have gone through the course at the Central Institute at Berlin.

The instruction of young Officers having thus been commenced in the company is further extended under the supervision of the battalion Commander, who, when directing the field service exercises, takes advantage of the opportunity to make the Lieutenants familiar with all the difficulties which they may encounter in war. As the field of operations is here much more extensive, the questions become of a much more complicated nature, and the situations much more varied.

Then, again, besides the problems which he thus has to solve during the general drills, each Officer is called upon to direct at least once a year

an independent operation organized on a large scale (*Felddienstübung*) (a field service practice); then to furnish a detailed account of all that he has done or taken into consideration in performing the service with which he was charged, adding, if necessary, a clear and precise report, together with a sketch of the ground.

The object of all these labours is to prepare Officers for the performance of their task in time of war, but there are other exercises again which are intended more especially to develop the faculty of forming a sound judgment on the military questions of the day, to maintain the standard of general education, to keep up an interest in professional matters, and lastly to lead everyone to make an exhaustive study of some subject and to reflect seriously upon some branch or other of military science. It is on this account that every Prussian Officer is called upon to write during the winter a memoir on some given subject chosen by the battalion Commander, who must take care that it is one calculated to make the writer work and reflect. They, therefore, put questions in such a way that it is impossible to give a direct answer in a few words, and that the Officer may be, on the contrary, under the necessity of searching diligently in the books at his disposal. Thus they will not be contented with requiring an Officer to narrate some incident in military history, like the description of a battle or of a campaign, but they will insist upon his making critical remarks upon it, or upon his discussing with judgment the influence of some particular circumstances upon the course of events. Officers may assist themselves with the works contained in regimental and divisional libraries, the contents of which are so well known to battalion Commanders that they can avoid questions which would oblige Officers to buy books not to be found in them.

The subjects which are to be treated are usually made known at the commencement of autumn. As the memoirs have to be sent in about the 1st of February, four or five months are thus allowed for their composition. Officers are, therefore, obliged to pass the winter in collecting materials, in reading them, and in discussing them with their comrades, in short, intellectual work is forced upon them during some months of every year. Besides this, all Officers have annually to make a map on a fixed scale, which is an excellent way of familiarizing them with the use of conventional signs, accustoming them to read maps and to understand their use in the field.

Of all these laborious Officers, the battalion Commander, who cuts out the work for the others, is certainly not the least occupied. How often it has happened to me, when calling unexpectedly in the evening upon one of these good Majors, to find him positively buried in maps and military works. "You see," he would say quietly, "I am busy preparing next week's work for my Officers. I have been studying for some months the campaign from which I am drawing my theme."

Again, the Colonel himself has not less to do, for he must, when it comes to his turn, criticize the work of his Officers, so that he is obliged to make a careful study of all the subjects dealt with.

Captains commanding companies are alone exempt from this kind of labour, being fully occupied with that of instructing their companies.

They take to it, however, very zealously on their own account, for the very fact of their being allowed so much initiative in all matters renders imperative an incessant study of military literature, and of the manifold questions raised by the instruction and administration of troops.

Such are the series of exercises which all Officers have to perform in peace time, but there others no less useful, though of a more special character, which are much practised in a great number of regiments.

I mean the soirées or lectures to which the establishment of mess-houses has given rise in many corps. They generally take place once a week, all Officers attending, and even often inviting friends to them. The entertainment

consists of military discussions, or of a game of Kriegspiel, preceded by a lecture on some event, or on some interesting military question. Regimental commanding Officers are the first to set the example, which is followed by the other field Officers, and even young Lieutenants frequently lift up their voices. As a general rule the lecturer chooses his own subject, but it is not unusual for an Officer to take up some question of general interest at the desire of his comrades or of his chief. At all events there can be no doubt that a paper, intended to be thus read in the presence of equals and superiors, demands of its author sustained effort and fixed attention.

I here close my quotations from the "Report on the German Army." A great deal more might be said upon the subject of the "Training of Infantry for Battle," as carried out in Germany, and especially on the training of Officers, but the latter branch of this subject will ere long (indeed before the publication of this paper) be treated of, together with the cognate subject of the rules regulating promotion, in the theatre of this Institution by one who has the advantage of personal experience in the matter. I doubt not that he will add many important details to those given by me.

Imperfect as my sketch has been, it suffices, I think, to prove that I was justified in claiming for the German Army, as I did at the commencement of the article, the first place amongst Continental armies for thoroughness in the work of training infantry.

I doubt not that the army of every civilized nation has some good points in its system which other armies might do well to imitate, but I believe, as far as regards my subject, at any rate, there is no military system from which more may be borrowed with advantage than that of Germany.—L. G.

SOME CAVALRY TOPICS.

BY LIEUT.-COLONEL F. CHENEVIX TRENCH, 20th HUSSARS.

(1.)

*Observations on the efforts made to perfect the Organization of Cavalry in
Continental Armies.*

"THE next great war will begin with a fierce and long sustained cavalry battle. Such is the opinion expressed by German Officers of all ranks and of every branch of the service."

The reasons which have caused this opinion to be so generally entertained are not far to seek. The services which, owing to exceptionally favourable circumstances, the German cavalry was able to render to its own side in the Franco-German War have so long been matter of history that it would be

waste of time to dwell upon them here. But it was from the first plain enough, that the real cause which enabled these services to be so easily rendered was that in that campaign the efficiency of the cavalry was all on one side, and that the German horse, except in the actual battle-fields in the earlier part of the campaign, met with but little or no opposition in fulfilling the rôle which they were directed to carry out, and which step by step they realized that it was, under existing circumstances, possible for them to play. None, however, are better aware than the Germans themselves that they can scarcely expect that in their next campaign with one of their neighbours, the task of the cavalry covering the advance of their armies will be so unopposed, and therefore so easy, as it was eleven years ago in Eastern France.¹ When, as will probably be the case in the next great European campaign, the cavalry of both sides are matched and handled with fairly equal skill, and when whole divisions of that arm are pushed forward with the same objects far in advance of the armed hosts which respectively follow in their wake, it is obvious that sooner or later collisions must take place between these opposing bodies of horse, and that several cavalry actions must in all probability open the campaign. The prestige which naturally attaches itself to the victors in the first contest of a campaign, and the moral effect produced by such first successes, are advantages for which too high a price can scarcely be paid. Hence it is, that to ensure the winning of any such first contests, and to gain the advantages at the outset of a campaign, which only a highly trained cavalry can secure, has during the last ten years been one of the chief pre-occupations of the leaders of the German army. This they hope to do by means of improvements in the organization and tactics of their cavalry which, in addition to constant and laborious training, are well calculated to give their numerous regiments of that arm the pre-eminence over any opponents whom they may be called upon to meet. From the morrow of their last war not a day was lost in studying the question in all its phases, and in taking means to correct the shortcomings and to supply the deficiencies both in equipment, organization, and tactics which the then recent campaigns of 1866 and of 1870 had caused to be felt.

This recognition by the German military chiefs of the necessity for improving their cavalry afforded opportunities to two German Officers of unquestioned merit and ability to come to the front as reformers in the art of handling the cavalry arm. I refer, of course, to Generals Von Schmidt and Verdy du Vernois. Both of these men may fairly claim to have exercised a predomi-

¹ How easy this task was may best be realized by the almost entire absence of casualties suffered by the most active and enterprising of the German cavalry divisions. For instance, in the 4th cavalry division, which rendered such signal services to the 3rd German army, the losses in men up to the time the division reached the Marne were as follows :—

From the beginning of the war—

Killed ..	..	..	..	6
Wounded ..	..	..	..	4

From the Vosges to the Marne—

Killed ..	..	..	..	1
Wounded ..	..	..	..	3

These figures are official.

It can be no matter for surprise that in a country where no resistance was offered, the cavalry could play a very active part.

It may also be observed that the regulations which were in force for the French cavalry at the outbreak of the campaign were those which had been issued at the camp at Chalons on August 9th, 1867. In these regulations it was strictly prescribed that the main body of a cavalry division was always to march in rear of all other troops. See "Lewal's Etudes de Guerre," p. 248.

nant influence over the tactics and instruction of the German cavalry. In point of fact, as Germany, in all military matters, leads the way, while her neighbours forthwith proceed to copy and imitate her, the influence of the teaching of these two men may be said to have extended over a far wider area than that of the cavalry of the German army only. It needs but a cursory acquaintance with the cavalry regulations of the principal Continental armies to perceive how much they owe to German inspiration, and to the principles adopted in the German cavalry service.

What has made the teaching of these two German Officers the more valuable, is the fact that the writings of the one may be said to complement and supply to a great extent the deficiencies of the other. The famous section V of the Prussian Cavalry Regulations, of which General Schmidt was the author, was published on the 4th June, 1874, and the German cavalry manoeuvres of that and the two next succeeding years (1875 and 1876), were carried out (even after his untimely death) in strict accordance with the views and principles of action which he had advocated and prescribed. The avowed aim and purport of section V of the Prussian Cavalry Regulations was to show how to handle and manoeuvre masses of cavalry on the open field, acting against similar masses, and always with a definite object in view. In short, it was framed by the author in order to supply what was felt in the earlier part of the Franco-German campaign to be a great want, viz., a defined and recognized system of offensive and defensive tactics for large bodies of cavalry when operating against the enemy in the open field. But neither in the instructions therein contained nor in the actual practice of the German cavalry manoeuvres inspired by and carried out in accordance with General Von Schmidt's ideas could the student or enquirer learn much of how to manage large or small bodies of cavalry in the duties of reconnaissance and scouting, or how to act on many of the various emergencies with which cavalry soldiers engaged in such duties have on active service to deal. For instruction in these and other necessary details, we have to look to General Verdy du Vernois, whose work entitled "Die Kavallerie in "Armee Verbände," has long been regarded, both in Germany and elsewhere, as a sort of official text-book on the whole subject.

It is almost needless to say that, in the present day, every improvement in organization, in tactics, or mechanical appliance which may be introduced and adopted in any of the great Continental armies, is at once noted, watched, and scrutinized by the jealous eyes of neighbours and rivals. This being so, the example of the German cavalry, and the efforts it has been constantly making ever since the termination of the Franco-German war to develop and improve the capabilities of the cavalry arm, were sure to attract notice and remark. To any one who has cared to keep himself *au courant* with what has been doing during recent years in the cavalry of Continental armies, the efforts which have been made to emulate, and in some degree keep pace with the German cavalry in its readiness for action, in tactical skill, in its study of minute details, and in its endeavours to develop the general capabilities of the arm, so that it may be able to endure the strain of a prolonged campaign, are patent enough. Improvements in organization, in arrangements for rapid mobilization, so as to enable the cavalry to take the field almost simultaneously with the outbreak of war, the publication of revised and enlarged cavalry regulations, the institution of annual cavalry manoeuvres on a considerable scale, extending over wide zones of operations, and in which every effort is made to render the conditions such as will give the greatest possible *vraisemblance* to the work that would have to be done on a campaign; elaborate experiments with different kinds of condensed forage; the formation

¹ As an instance of this may be mentioned the "raid" made by the Russian cavalry in Russian Poland in the autumn of 1876.

in time of peace of independent cavalry divisions, which are to be launched forward at once to cover the advance of the main armies on the outbreak of war ; the permanent quartering of large bodies of cavalry in the immediate neighbourhood of frontiers ; the issue of improved firearms for the cavalry arm, the organization and systematic training of cavalry pioneers ; all these are signs which he who runs may read. At any rate they are amply sufficient to show that the armies of the great military Powers are fully alive to the great importance of the rôle which will devolve upon their cavalry in the future, and of the necessity of its being able to act efficiently on the very first outbreak of war.

After having thus taken a general and cursory view of the efforts which are nowadays continually being made in some of the great European armies to bring the efficiency of the cavalry arm to the highest possible pitch, it will be worth while to enumerate somewhat in detail some of the more important principles and methods of action which have been advocated and prescribed during recent years by General Verdy du Vernois, and other well known writers, as applicable to the management and leading of an advanced cavalry division in modern warfare, and to show how some of them have been put into practice, and rehearsed at recent Continental cavalry manœuvres.

(2.)

The Mission or Rôle of an advanced or independent Cavalry Division or Brigade.

Before proceeding further, it may be well here to pause and ask, what is the generally accepted view of the mission or rôle which in future campaigns will devolve upon the cavalry arm ?

It may be observed at the outset that the rôle which an advanced cavalry force has to play must vary so greatly in each particular case and be dependent upon so many conditions, both of a strategical and topographical nature, that it would be difficult adequately to describe it in concise and definite terms. In other words, it would scarcely be possible within the scope of a few lines to embrace and include the manifold duties which in a European campaign, especially in a highly civilized country, the cavalry of each side will be called upon to fulfil. But in general terms and at somewhat greater length than a mere definition will admit of, the various tasks of the cavalry both at the beginning of and during a campaign may be summed up as follows :—

I. The general performance of outpost duties, thereby ensuring the safety and security of one's own army in rear.

II. The repulse of the enemy's cavalry at any point where it may endeavour to advance, so as to prevent it from gaining information as to the movements and intentions of one's own army in rear.

III. Exploration and reconnaissance of large tracts of country in front or on the flank of one's own army, in order to find and keep touch of the enemy, and to obtain intelligence as to his strength, position, and probable intentions.

IV. Covering the mobilization of one's own army in rear, and protecting railways and telegraph lines from raids of hostile cavalry.

V. Hindering and checking, where possible, the mobilization of isolated portions of the enemy's army.

VI. Anticipating the enemy in gaining possession of special positions, such as roads, passes, bridges, defiles, postal and telegraph offices, the possession or destruction of which is likely to prove advantageous to one's own side, or available for the purpose of harassing the enemy or checking his advance.

A little reflection will show how varied and extensive are the duties which are included under the above general heads, and enable one to realize that a numerous and well appointed cavalry is more than ever essential nowadays to the success and safety of an army in the field.

Supposing that the foregoing *résumé* of the duties and mission of an advanced cavalry force be accepted as correct, it may be observed that these duties may be defined under two heads, viz., the general duties which have just been detailed; and secondly, special tasks which a cavalry division or brigade may be directed to carry out. A few examples taken from the Franco-German campaign will serve to show what kind of instructions were issued to the German cavalry, and the manner in which these instructions were carried out.

In August, 1870, the 2nd German Army, when advancing from the Sarre to the Moselle, was preceded by its cavalry divisions. On the 9th August this line forming a cordon extended from Sarre Union to Gross Tenquin, Falquemont, Fouligny, and les Etangs, and patrols were pushed on as far as the environs of Metz. Owing to this screen, which concealed their movements, the corps d'armée écheloned 8 or 10 miles in rear were enabled to carry out their marches in security without being subject to the inconvenience of having suddenly to halt and deploy to no purpose in consequence of the sudden and unexpected appearance of the enemy. In addition to this, the Commander-in-Chief, receiving numerous reports from all these cavalry patrols, was able to form an idea of the movements of the enemy, and consequently to direct his own corps d'armée, so that all useless marching and counter-marching was avoided.¹

Field-Marshal Prince Frederic Charles, commanding the 2nd German Army, to General Von Manstein, Commanding the IXth Corps d'Armée :—

“NEMOURS, November 18th, 1870.

“Above all it is important to have more detailed information concerning the position of the enemy to the north of Orleans, especially as to the strength and composition of his army, the extent of his front, and where his right begins and his left ends.

“The Generals commanding the 1st and 2nd divisions of cavalry will receive orders to push forward their explorations, especially round the two flanks of the enemy, in order to obtain information upon the points mentioned above, and with this object they will endeavour to make as many prisoners as possible.² Your Excellency will be good enough till further orders to send each day at noon to my Head-quarters an Officer as bearer of the latest news concerning the enemy, and all that may have taken place on your right flank.”

Extract of an order given to the IIInd German Army :—

“ORLEANS, December 6th, 1870.

“The VIth cavalry division is instructed to proceed by forced marches to Vierzon, and there entirely to destroy the three following lines of rail, viz. :—

- “1. From Vierzon to Bourges.
- “2. From Vierzon to Chateauroux.
- “3. From Vierzon to Tours.

“The Xth Corps will furnish the cavalry division with a strong detachment of Engineers provided with blasting powder, so that the destruction of these lines may be simultaneous.

¹ Borbstadt.

² With regard to this point Verdy du Vernois, in his work on the cavalry division, dwells upon the great importance of making prisoners, and of questioning them carefully, especially at the beginning of hostilities. After illustrating his remarks upon this head by the narration of an incident which happened during the operations against Bourbaki's army in the Franco-German war, he concludes his remarks by declaring that “the cavalry ought to give special attention to this point, for it is often one of the greatest services which it can render to a Commander-in-Chief.”

" I leave to the Commander of the VIth Cavalry Division the task of making the necessary dispositions for carrying out this order, but I shall count upon these railways being put *hors de service* by the 8th of the month. In addition to this, it will be the business of the VIth Division to inform me of the line of retreat followed by the enemy's troops who have retired by Ferté-Saint-Aubin. Communication will be kept up with my Head-quarters by means of relays of orderlies.

" The IXth Corps d'Armée will go into cantonments to the south of Orleans without going beyond the line of St. Hilaire-Olivet-Saint Denis, but to-day it will send a body of infantry to la Ferté-Saint-Aubin to support the cavalry.

" My Head-quarters will remain to morrow at Orleans.
" The Field-Marshal Commanding the 2nd Army,

" Prince Frederic Charles."

The first of the orders here quoted gives instructions as to the general task of the cavalry referred to. In the last extract it will be seen that a special mission is entrusted to the cavalry division.

(3.)

Instructions issued from Army Head-quarters to the Commander of an advanced Cavalry Force.

The following general principles and instructions are laid down by Lieutenant-Colonel Pierron, in his comprehensive and well known work, entitled "Les Méthodes de Guerre actuelles et vers la fin du XIX^{me} siècle."

They are so comprehensive that they will be found to include nearly all possible contingencies in almost any campaign, and I can hardly, therefore, do better than append a translation of the more important of them here.

The Commander-in-Chief of the army, after having determined upon his plan of operations, sends for each of the commanders of the cavalry divisions or brigades which are to be sent forward in advance of the army, and imparts to him the following information, viz. :—

That portion of the plan of operations which it will be useful to them to know.

The duties to be performed by the division, *i.e.*, to cover a portion of the front or a flank ; to gain touch of the enemy, to screen the movements of one's own army, to unmask those of the enemy, and to give information concerning them, to occupy the passages over an important river or stream before the enemy can do so, to hinder the mobilization of the enemy's troops, to seize the magazines, to make requisitions, to outflank the enemy's wings, to destroy his lines of communication and of supply, such as railways, roads, telegraph lines, canals, &c.

The proclamations which are to be published in the enemy's country, orders to the communes or districts to give up their arms, and to furnish provisions, abolition of recruiting, &c.

All that is known of the enemy up to date, of the composition of his army, of the positions held by him and of his intentions ; the doubtful points which it is desirable to clear up, the prints of the uniforms of the hostile army, &c.

A cipher for correspondence.

The portion of the front or flank which the brigade or division should reconnoitre, the delimitation which should be made of the zone of country to be assigned to each brigade or division, which should vary in breadth from five to ten leagues ; the necessity of reconnoitring both banks of any rivers or streams which may run parallel with the direction of the march. In the event of the enemy changing the direction of his march, the necessity of applying for fresh instructions.

Funds with which to pay guides and spies.

The Commander-in-Chief, moreover, notifies in what direction and to what place the intelligence concerning the enemy should be sent to him, and impresses upon his hearers the necessity of only sending him information which is of practical value, *i.e.*, to avoid all vague generalities, but to be precise as to the names of regiments, the nature of the enemy's troops (cavalry, artillery, or infantry), their uniforms and approximate strength, and the direction of their march.

He points out the bodies of infantry which the cavalry division can count on for the moment for support; and insists upon the expediency of making use of them as supports for the flanks, in order to draw the enemy's cavalry into an angle of cross fires; in case there is no infantry, some squadrons on foot, and an ambuscade on the borders of defiles, will furnish a better support than the cavalry disposed entirely in line.

As far as is possible the Commander-in-Chief causes a small body of infantry to follow up the cavalry division, such, for example, as a battalion of foot chasseurs to protect his rear, to support him in need, should he be driven back by superior forces, and to guard his cantonments, especially during the night.

Finally, he completes the organization of the division by attaching to it an Officer of engineers, a detachment of military telegraphists, or at least some employés of the telegraph department, and a railway engineer to inspect the condition of the railways, and to report in good time the repairs which it is necessary to make to them.

The Commander-in-Chief points out, moreover, what is to be done to the railway lines, *i.e.*, whether they are merely to be rendered *hors de service*, or to be destroyed entirely. The cavalry division should be provided with special tools for this purpose, and with dynamite cartridges carried on the saddles in order that the men should always have them to hand, as carts or vehicles of any kind are never to hand when wanted.

Officers who speak the language of the enemy are distributed among the squadrons at the front. In addition, one or several post office officials able to translate manuscript are attached to the division, to seize the letters in the post offices, the official documents in the town halls and printing presses, to extract information from them, and to transmit them to Army Headquarters.

Finally, the General commanding the division is informed in what direction and to what place he will send his sick men and disabled horses, and where the depôts are from which he will draw any necessary supplies.

The General commanding the cavalry division provides himself with a general map and also with detailed maps, identical with those of the Commander-in-Chief. The latter desires him, whenever he may have occasion in his reports to name any small place, to mention in brackets the name of the most important place which is nearest to it, in order to avoid the necessity of having to refer from one map to another.

The Commander-in-Chief, moreover, warns the leader of the cavalry division, that if the cavalry should receive the order to pursue the enemy, the plea that the horses were too fatigued to pursue will not be held as a valid reason for this order not being carried out. The horses which are not in a condition to carry out the pursuit should be left behind, and the squadrons will go forward with those which are most fit.

In cases where the cavalry receives an order to anticipate the enemy by occupying the passages, bridges, dikes, viaducts over a stream or river, or over a ravine, not only should these passages be watched by squadrons on foot, but the cavalry should strengthen itself by occupying the borders of villages and clumps of trees, where advantageous positions can be taken up, and should push forward patrols continually, so as to be forewarned of the

approach of the enemy. A report of such approach should be made direct to the Commander-in-Chief.

If, on the contrary, the enemy should have been beforehand and occupied the banks of the stream, the cavalry leader should ascertain the exact extent of the position which he occupies, and should point out in his report upon which flank he has discovered a passage or point from which a view can be got of the rear of the enemy's position, the breadth of the stream should be mentioned, as well as the comparative command of the two banks, in order that the army may be able to push forward, and make its preparations for bridging with pontoons, &c., as circumstances demand. Finally, the cavalry should point out the route to be followed in order to approach under shelter as near as possible to the enemy's position.

The commander of every detached party, whether it be brigade, regiment, or squadron, or any smaller party, must invariably point out and name to those under him who is to take his place, and to assume his functions and responsibility whenever he temporarily has to be absent from his post.

An officer of the General Staff detailed by the Commander-in-Chief of the army will accompany the cavalry division in order to gather and collate information on the special points upon which the Commander-in-Chief desires information, and to keep him constantly *au courant* with the general aspect of affairs. This Officer being unencumbered with any duties, and being conversant with the plans of his chief, should betake himself wherever he will be able to see and judge best.

The supplementary means of information by no means releases the commander of the cavalry force from the obligation of reporting direct to the Commander-in-Chief everything he learns concerning the enemy. In order the better to do this he will leave relays of orderlies between necessary points, in order to facilitate the transmission of news.

With these instructions issued from Army Head-quarters may be included the following important points which have to be considered, and arrangements which have to be settled, before the commencement of operations, in order to ensure the efficient working of a large cavalry force.

I will take, for the sake of example, the case of a cavalry division about to operate in front or on the flank of an army. The following list will be found, under ordinary circumstances, to embrace all points which are essential:—

1. All information that has been received concerning the enemy up to date.
2. The object to be attained.
3. The extent of front to be covered, *i.e.*, from such a point to such a point.
4. Connection with the brigades or divisions on either flank.
5. Co-operation of the troops which are nearest.
6. The strength of the infantry force upon which the cavalry can fall back, should it be unable to hold its own in front.
7. Reconnoitring squadrons who should both obtain and keep touch of the enemy, and who can seize a bridge or defile, &c.
8. Officers' patrols to be pushed out on the front or on the flanks.
9. Roads to be told off to brigades and regiments of the first line.
10. Communication of the several brigades of a division with each other.
11. The route by which the reserve brigade or regiment is to march.
12. Manner in which the division is to be concentrated, and its central point in case it should be driven back by superior forces.
13. Body of troops with which the commander of the division will march. Place where he will establish his head-quarters on arrival at the day's halting place.

14. News or intelligence to be sent direct—
 - (a.) To the Commander-in-Chief.
 - (b.) To the divisions or brigades.
 - (c.) To the troops in rear.
- Prisoners and documents to be sent to army head-quarters.
- Doubtful points concerning the composition of the enemy's forces to be cleared up.
15. Railways to destroy or to protect or to place temporarily *hors de service*.
16. Telegraphic lines to be cut off or to be watched and taken care of.
17. Bridges to be surprised or guarded.
Rivers and streams to be patrolled and watched.
18. Place in the column of march of the reserve of cartridges, of the reserve of tools, and of the light equipage for the construction of bridges.
19. Distance at which the heavy baggage of the division is to follow.
Designation of the brigade which is to furnish the escort to the baggage.
20. Relays of orderlies to be left in rear for the purpose of forwarding correspondence.
21. General alignment of position to be occupied after the march.
22. Designation of bivouacs or cantonments.
Communication between bivouacs or cantonments by means of orderlies or by postal service, alarm signals, and posts.
- The situation of the head-quarters of the brigade.
23. Precautions for security : outposts, patrols, reconnaissances to be pushed far ahead. Methods on which signallers are to be made use of.
24. Telegraphic station where dispatches brought in by orderlies are to be sent to.
25. Measures to be taken concerning rations and forage.
 - (a.) Distribution of rations and forage.
 - (b.) Organization and march of the wagons, &c., necessary for its transport.
 - (c.) Reserve of oats to be carried.
- Subsequent measures to be taken :—
26. Watches to be regulated by that of the Chief of the Staff.
27. Requisitions to be made for—
Rations,
Forage,
Horses and wagons for transport,
Linen,
Leather,
Tools, &c.
28. Delimitation of zones of requisition between brigades or regiments.
29. Disarmament of the enemy's country. Proclamations to be posted up.
30. Orders to be given concerning sanitary regulations.
31. Measures to be taken to get rid of men and horses who may become sick, wounded, and ineffective.
32. Establishment of horse infirmaries.
33. Orders concerning the artillery and its supply of ammunition.
34. Guides, maps, and statistical documents to be procured.
35. Indication of the map which the commander of the division makes use of in giving his orders.
36. The relief of squadrons, regiments, or brigades in first line.
37. The dispatch or recall of detachments. Arrangements for rationing and providing them with means of transport, if necessary.
38. Reports which these detachments should furnish while detached.
39. Measures concerning discipline ; provost-marshal and assistants ; prisoners' safe-conducts, &c.
40. Indents to be addressed to the nearest dépôts for fresh supplies of stores.

41. Requisitions to be made in good time for compressed hay, forage, cakes, &c.
42. Returns to be sent in.
Accounts.
Present states.
Diaries of march.
43. Secret-service funds for paying guides, spies, &c.
44. Arrangements for the issue of pay to the troops.
45. Organization of the postal service.
46. Proclamations to be given to the civil authorities.
47. Time and place to which reports are to be sent in on the morrow.
48. Officers to be detached, to march with bodies of troops which may be marching on either flank, in order to be constantly *au courant* with their movements.

It is not, of course, to be supposed that it would be necessary in every case to take all the measures which have here been named.

This list has been drawn up with the object of including all the more important contingencies which would in any case have to be provided for.

(4.)

*Principles which should guide the Disposition, &c., of a Cavalry Force
which is to cover the Advance of an Army.*

It is obvious that when a cavalry force has to explore, as well as to ensure the security of a zone of territory which may be from 15 to 20 miles in breadth of front, the Commander of it, if he is successfully to fulfil the duties entrusted to him, must in each case conduct his operations upon some well-considered and definite plan. For what is the work which the brigade or division has to do? Briefly expressed, and omitting minor details, its rôle is this: Firstly, it has to find out what the enemy is doing or intending to do; and, secondly, it has to prevent the enemy from finding out what one's own side is doing or intending to do. In order to accomplish the first object, it is necessary that the cavalry force should be extended on as wide a front as possible; in order to accomplish the second, it must be so disposed as to be able rapidly to concentrate and fight. Thus it will be seen that the rôle of the force is not only a double one, but that the conditions of the two main objects it has in view are directly opposed to each other, inasmuch as the means which would naturally be taken to ensure the feasibility of the first of these objects render the second one doubly difficult to carry out.

As this whole subject, owing to its great importance, has been during recent years amply dealt with by well known military writers, it is only natural that as a result of the fresh discussion which it has undergone, and of the experience which has been gained, both in peace manoeuvres and in actual service, certain general principles should have been prescribed and laid down in each of the great Continental armies, as being those which it has been considered best to carry out and adopt. In order the better to do this, it will be as well to glance at the principles of action which have recently been advocated and prescribed in some of the leading Continental armies. I propose, therefore, to take for this purpose the methods of action in the French and German cavalry, inasmuch as the *modus operandi* adopted in each of these armies may be said to present a contrast from which some instruction may be derived.

Since the war of 1870-71, four "*règlements d'instruction*" have been officially issued for the use of the French cavalry, viz.:—

1. The practical instructions of 17th February, 1875, on the duties of cavalry in the field.

2. The instructions of 27th June, 1876, on the duties of cavalry acting in advance of an army.

3. The regulation of 17th July, 1876, on parade movements.

4. The provisional instruction of 1st July, 1877, on cavalry marches.

It is with the second of these regulations with which we have here to deal. The instructions laid down in them for the disposition of a French cavalry division, consisting of three brigades of two regiments each, may briefly be described as follows :—

(For the sake of clearer explanation, I will call these brigades the 1st, 2nd, and 3rd brigades, and will distinguish the two regiments composing each brigade by calling them the right and left regiments of their respective brigades.)

The 1st line is composed of two regiments, viz., of one belonging to each of the two brigades, say the right regiment of 1st brigade, and the right regiment of 2nd brigade.

The 2nd line, which is to follow the 1st, in support, at about 6 miles or so in rear, is composed also of two regiments, say the left regiment of 1st, and the left regiment of 2nd brigade. Each of these latter corps is in rear and support of the right regiment of its own brigade. The 3rd brigade forms a general reserve on a main central route, if possible about 3 or 4 miles or so in rear of the 2nd line.

The two regiments forming the 1st line each send forward two squadrons, the interval between them being regulated according to circumstances, i.e., by the nature of the country, the extent of the front to be covered, &c.

The remaining two squadrons of each of the regiments forming the 1st or advanced line, follow and are supposed to remain equidistant between the advanced squadrons of the 1st line and the 2nd line. If a flank is exposed to attack, these squadrons are to march so as to protect it, otherwise they march in rear of the centre of the squadrons which have preceded them.

2nd Line.—The regiments in 2nd line march on one of the routes which may be available, and should either be in rear of the centre of the regiment of their own brigade, the squadrons of which are extended in front, or in rear of either flank of it which may be exposed to attack. The 2nd line has to assist the 1st line in reconnoitring, by throwing out flanking patrols which are to go out to considerable distances, and also to send out Officers' patrols to the front, which are to avoid going over the ground which has been traversed by similar parties sent out by 1st line.

The military student will not fail to detect at once some cardinal errors in the regulations which I have just described. The more striking of these are the stiffness and formality of the whole formation, the too great distribution of force, and consequent weakness of the whole line at every point. When these regulations were first issued, these and other grave defects did not escape keen-eyed German military critics, and the comments of one of them, which are supposed to be addressed to the French cavalry, will serve to show their opinion of the principles officially prescribed by the French military authorities.

"In carrying out the exploration of a section of country by cavalry, the only "sound system is that of concentration.

"The French regulations of 27th June, 1876, are based on a false principle. "In seeking to be everywhere, you will virtually be nowhere, and in this vast "dispersion, where your groups are subdivided *ad infinitum*, squadrons are no "longer squadrons, regiments are no longer regiments, nor are brigades "any longer brigades. You believe that you will be able to reform in time to "be of use to the division which you have broken up into small fractions "over a section of country of from 30 to 35 kilometres (18 to 20 miles) in "breadth, and with a depth of from 15 to 20 kilometres. But is not this "an illusion? and are the risks which you run compensated by any real

" advantages? Your isolated parties are too strong, if they are only intended for transmission of intelligence, they are too weak if they are meant for resistance, or to take an offensive part. Again, you attempt to regulate "in too dogmatic a fashion a service which should be elasticity itself.

" If your regulations do not prescribe, at least they seem to advise a normal disposition, and the sort of mathematical form which this disposition assumes entirely destroys any spirit of initiative, because you will always feel yourself more or less bound to this figure, even when circumstances may render it advisable to adopt quite different dispositions."

The German critic whom I have here quoted might have added that, in addition to these grave defects, two-thirds of the whole division practically passes at once beyond the Divisional Commander's control, and that more than two-thirds of it are continually engaged in the harassing work of reconnaissance and patrolling duties. It is only fair to the French cavalry to state that the system officially prescribed for them meets with their almost universal condemnation. Thus, in an interesting article which appeared in the "Journal des Sciences Militaires" for February, 1879, these regulations are severely criticized, and at the French cavalry manoeuvres which took place in the neighbourhood of Paris in September of the same year, I found that they had by common consent fallen utterly into disrepute, as being too formal and quite inapplicable to the varied exigencies of actual warfare.

The principles accepted in the German army may be described as nearly the opposite of those prescribed in the French army.

In the first place, they adopt a far smaller zone of operation for a division, viz., 15 kilometres, or 20 at the most (*i.e.*, 8 or 10 miles). In order to be able to tell off a division to such a small space they draw freely from their great force of 93 cavalry corps. At the outbreak of hostilities, all the cavalry at the disposal of an army should be thrown forward in advance of the front, and the Germans do not hesitate to borrow from their divisional cavalry the number of regiments necessary to make up the independent cavalry divisions to the requisite strength of six regiments, *i.e.*, three brigades of two regiments each. The divisional cavalry corps, in taking their share in the work of general exploration, will render far better service to their infantry as units of the independent cavalry division, than they could render if acting as isolated bodies. Moreover, they need only be thus detached from their divisions for a time, and rejoin them later when their work of exploration and reconnaissance has come to an end.

Provided that the front to be covered does not exceed 15 kilometres, the system which finds favour in the German army is to hold one, or at most two, of the grand arteries of communication which run at right angles to this front. Thus, the whole division is concentrated upon one or two routes, having as its advanced guard a brigade preceding the main body of the division, at a distance of from 1 or 2 miles, during the march, and at a distance of from 5 to 6 miles during the time that the division is in cantonments or in camp.

A couple of squadrons are generally detached from the leading regiment of the advanced guard, in order to furnish a sufficient number of scouts, and their immediate supports. These are pushed forward in front of the regularly formed advance guard to as great a distance as the nature of the country, the proximity or otherwise of the enemy, or similar reasons, may seem to demand. If circumstances should require it, in addition to these scouts, small well-mounted patrols, consisting of an Officer and from four to six men, are pushed very far ahead, either on special missions or to gather what information they can, and are granted a complete independence for reconnoitring purposes. Flankers are generally detached from the main body of the advanced guard. Between the advanced guard and the division should be stationed posts of sufficient strength to ensure the proper and efficient transmission of news.

The observations laid down by Verdy du Vernois on this head are as follows :—

"The movements of armies and of corps d'armée must follow the principal roads, consequently it is these which should first engage the attention of the cavalry. It is, however, no less necessary to overrun and reconnoitre upon a sufficiently large scale the country where the enemy may chance to be, or that in which his detachments may be moving.

"The extent of country to be reconnoitred determines the amount of cavalry to be placed in the first line, and decides the question as to whether a division can do the work assigned to it with a single brigade, or whether another brigade must be placed in front, or even a third. It is plain that the less one expects resistance, the less need there is of making the line compact, and the more the sphere of exploration can be extended.

"The main body of the division will always have to make its action felt in the direction where it has most chance of encountering the enemy, or where one supposes the main body of the forces to be found. It follows, therefore, that the main body ought to be placed at this point in rear of one of the wings, and if the extent of the first line is too great to enable it to give support opportunely to the wing which is attacked or opposed by the enemy, it will be necessary to give the latter great independence and a separate mission, or even to assign to it in case of need, a separate line of retreat.

"Generally speaking, a cavalry General will always keep in view the necessity of concentrating his forces, and will endeavour to avoid their dispersion. But while recognizing this principle, it must be borne in mind that the carrying out by a division of cavalry of the service of exploration necessitates the detachment of large bodies in cases where the extent of country both in depth as in breadth, or the exigencies of the strategical situation, do not admit of having a reserve in the centre."

Captain Von Widdern¹ discusses this question of the actual disposition of the different component units of a cavalry division as follows :—

"The front and depth of a cavalry division depend, in the first instance, upon the width and extent of the zone of country which is assigned to it for exploration, and on the proximity of the enemy. The front should be defined exactly. It may be such that the cavalry division is obliged to keep the main body of its forces on a single route. On the other hand, the front assigned to the division may be such as to necessitate or to offer it the opportunity of marching on two or more parallel routes.

"In the first case, one of the light brigades with a battery should form the advanced guard, followed by the main body formed by the other two brigades. In the second case, viz., that of there being two or more parallel routes available, two brigades would take the main route, viz., the light brigade as an advanced guard, the heavy brigade as its main body. The least important route should be taken by the other light brigade. In the third case, viz., when there are three parallel routes, the brigades would march parallel to and as far as possible abreast of each other, each brigade having its own advanced guard. This latter disposition is the more favourable, inasmuch as the troops march more quickly, are more easily quartered in cantonments and fed, and occupy a greater extent of territory, a point which is of material importance as regards gaining information. As long as no contest is anticipated during the next twenty-four hours, this order of march ought to have the preference, even though the columns are a short day's march distant from each other. In such circumstances, a concentration of the whole division is always possible within a day.

"As soon as the first contact with the enemy is felt, the division ought to

¹ "Handbuch für Truppenfuhrung und Befehlsahfassung." By Von Widdern.

"contract its front, so that a concentration might easily be effected in a few
"hours.

"It is necessary also to arrange for a reserve. For instance, it may be
"managed in the following manner. The two first light brigades are placed in
"the first line; to each of them are assigned a route, a zone of territory, and a
"special portion of work, whilst the heavy brigade follows at a little distance,
"and takes the main route. In a country which is at all practicable for cavalry,
"a cavalry division is sufficiently concentrated when the main bodies of the
"columns following the extreme flanks are 10 kilometres (6 miles or so) from
"each other, while the reserve brigade is 5 kilometres in rear of them.

"When the detachments charged with the duty of exploration and scouting,
"which are sent on many miles ahead, signal the approach of large forces of the
"enemy, and when it becomes necessary to reinforce one of the flank brigades
"with the reserve brigade, this can be done in half-an-hour, if the brigade to
"be reinforced is on the same route; and in an hour-and-a-half if it is on another
"route, counting from the moment that the brigade requiring support sends to
"ask for it. All this is on the supposition that there is a prospect of the
"cavalry being able to maintain itself in front.

"The complete concentration of the division can always be effected, *i.e.*, if the
"lines of communication are in good order, in a few hours, either on one of the
"brigades of the first line, or on the reserve brigade.

"In all cases the division should take up a formation, such as has here been
"prescribed, when the hostile cavalry is not numerous or enterprising, or when
"the country is open and well provided with transversal roads, as a concentra-
"tion can under these circumstances be completely effected in a few hours.
"Moreover, the scouts can widen the front to be explored by at least 6 or 7
"kilometres (3 or 4 miles) by extending out on the flanks of both wings, so that
"the total front to be explored by the division could be made to stretch over
"25 kilometres.

"The more distant the brigades marching on parallel lines are from each
"other, the more independent, it is needless to say, they ought to be of each
"other. It is desirable that each of them should have a battery at its disposal,
"and it is only in a country where there is a fear that the artillery might
"hamper the march of the brigade, that a battery should not be given to the
"advanced guard brigade.

"The Staff of the division should march with the main column, *i.e.*, with the
"reserve brigade. It is this latter which, equally with the other columns, must
"hold itself responsible for the security of the baggage train. When a detach-
"ment of infantry (on carriages) is attached for the day to a cavalry division,
"its place on the march is usually with the main body of the principal column
"either in front or in rear of the artillery. When not on the march this
"detachment is given the duty of protecting the cantonment of Head-quarters,
"or employed to occupy defiles," &c.

All the foregoing remarks apply solely to the large units or bodies which
compose the cavalry division. So long as the enemy has not been found, or
while only small detachments of his force have to be dealt with, or while he
gives way and continues to retreat, the work which devolves upon the first
line of the division ought to be entrusted to small scouting detachments.

The strength of these scouting parties will vary from an Officer's patrol to a
squadron, and they should keep in front of the regularly formed advanced
guard, or should patrol to the right and left of the zone of country occupied
by the division on the march. These scouting parties, whose duty it is to
gain contact with the enemy, should be relieved from any direct obligation of
providing for the scarcity of the division, and, in case of failure, should remain
absolutely independent of the movements of the main body.

While the division itself marches to the front by either a single route or by
several parallel or converging routes, and alternately arrives at certain points

which have been determined upon, these scouting parties, especially when they have once gained touch of the enemy, should be left as much as possible to their own devices, and should move forward with the sole object of adding to and completing the information already acquired, and of pushing their investigations further and further. The greater the distance which separates the division from the enemy, the more necessary is it for the scouting parties to push far ahead.

In order to secure the post office, letters, and telegrams, and the local papers, &c., and, in short, to obtain every information which, from a military or political point of view, may be of importance, it is necessary to act by surprise, and there is no better means of ensuring this great element of success than by sending forward Officers with small parties far ahead of the advanced guard, who will suddenly appear at points where cavalry is not expected.

In order to devote themselves more entirely to their task, these parties should be free from any obligation to act on the defensive, nor should they be instructed, in case they have to retreat, to follow any particular route. To endeavour to rally them every day on the advanced guard, or on any other support thrown forward in advance, is a task which will often be impossible, unless one wishes to run the risk of seeing them lose all trace of the enemy, or let go the touch which they may already have established with him.

While on the subject of these scouting patrols, it is worth while to notice a point which has been a good deal mooted on the Continent of late, viz., the necessity of entirely separating the service of outposts for watching over the safety of the army or main body from that of scouting and gaining intelligence of the enemy. It has not unfrequently happened, both on active service and at manœuvres, that the difference between these duties has not been sufficiently defined, and they have consequently been found to clash with each other. The gist of the views prevalent upon this point may be summarized as follows :—

In order to be informed of the movements of the enemy, it is necessary to be constantly in contact with him. To protect oneself against surprise, it is necessary to have outposts and detachments in advance of the main body, but these latter are not able to go far from the former, inasmuch as they may have to fall back upon it for protection. The result is, therefore, that if the enemy is at a certain distance, the detachments charged with the duty of protecting the main body cannot remain in contact with him. As it often happens, moreover, that the opposing armies are several days' march distant from each other, it is necessary that the duties of scouting and gaining intelligence, and those of ensuring the safety of the army (*service de sécurité*), should be separated and entrusted to different troops.

Thus, while on the one hand those whose duty it is not to lose sight of the enemy are alone able to furnish continuous information about him, the detachments, on the other hand, who have to perform the outpost duties, cannot furnish any intelligence about the enemy, unless they are in close proximity to him. The two tasks, moreover, are quite distinct from another point of view, viz., that the results of the work performed by those who are respectively charged with these duties concern different chiefs. It is necessary that the Commander-in-Chief of an army should have continuous reports concerning the movements of the enemy. The object of the patrols sent out by the outposts or columns on the march is merely to ascertain if the enemy is within range, or at any rate quite near. The exact whereabouts of the enemy matters but little to the subordinate commanders of these columns, as long as he is not within range. Thus, whenever the enemy is not to be found within the zone of country which is reconnoitred by the patrols of the outposts and picquets, it is necessary that the Commander-in-Chief should maintain contact with him by means of detachments of scouting

patrols who should look only to him, and who should receive instructions directly from him. This plan will be specially favourable to the efficient execution of the work.

With regard to the dispositions necessary for the outposts, and also for the fight, it is worth while to note the following points, viz., that the detachments engaged with the enemy ought to find their first support, and even their special reserve, from their own corps. This same principle should also be observed when the troops composing a division are distributed over several routes. Thus, when several parallel routes are available, a brigade should march on each of them. If a section of country of a certain extent is told off to a brigade, and if circumstances demand that this brigade should be subdivided into several small columns, it is a mistake to put an entire regiment in front line, and to provide it with the supports which may be necessary to it by means of detachments borrowed from other corps. Such an arrangement as this would greatly hinder the transmission of orders, especially for the commander of the regiment, and would also render proper surveillance difficult. It would, moreover, create confusion and inconvenience in rationing the troops.

With regard to the artillery, Captain Von Widdern remarks as follows:—
"If the division has as many batteries as brigades, each brigade retains as a
"matter of course its battery when marching by brigade. If, as often happens,
"the division has only two batteries for three brigades, that brigade which is
"eventually to be detached should take with it a battery, leaving the other to
"march with the main body. If the division marches upon a single route,
"the advanced guard brigade should take with it one battery, and if there is
"any question of a pursuit, it should take them both. There are, however,
"many cases in which (although it is an infraction of the ordinary rule
"observed) there should be no hesitation in giving a division of a battery to a
"detachment which has to be separated from the main column. It is especially
"advisable to do this in a country where the population show an active resist-
"ance, or when hostile irregular bands will probably have to be dealt with,
"who will endeavour to bar the entrance into woods, defiles, and villages.
"The mere presence, and much more the coming into action of artillery,
"at once gives a cavalry force a most imposing effect. A few shells thrown
"into a village where the population contemplate resistance has a marvellous
"effect."

With regard to Captain Von Widdern's opinion, which is here expressed, on the subject of breaking up the artillery into small detachments, it may be as well to make a few remarks.

It may sometimes be advisable to detach a portion of a battery in the manner just described, but I think there is no doubt that it should be regarded as quite an exceptional measure. It is, indeed, generally accepted that there is nothing to be so much guarded against as the dissemination of artillery, and it is highly important to know how to resist the demands of commanders of detachments for a few guns. Upon this point, Verdy du Vernois remarks: "It is not necessary for artillery to penetrate into "the zone of exploration. One often sees at manoeuvres a detachment of "two or three squadrons precede a column with a battery of horse artillery "attached, an arrangement which, even at manoeuvres, has numerous disad- "vantages, because the squadrons should spread over the country, and should "only keep together a small portion of their effective strength; even this party "may find it advisable to quit the road as soon as the enemy shows himself. "In such a case the artillery will be forced to follow across country over all "sorts of ground, and the horses will have a great deal taken out of them "before they have been able to render the least service. Artillery has need "of some little time to get the proper range, and the small parties of cavalry "who are at these times to be seen in the far distance offer but a very small

"target to fire at, and they are always on the move. They can, moreover, "always find an undulation of ground behind which to take shelter, as soon "as a shell bursts near them. In addition to this, a small body of cavalry "under these circumstances has always to be thinking of how to take care of "the guns, and this paralyses all its movements. For these reasons it is only "under exceptional circumstances that a battery should be detailed to accom- "pany a single regiment."

What, then, are the main principles of action to be deduced from the epitome of opinion which has been quoted? It seems to me that they may be summed up somewhat as follows, viz :-

(1.) That the brigade or division must be of a certain considerable strength in order to be able to meet the onerous and varied duties which it may be called upon to perform.

(2.) That it is necessary, in arranging for the disposition of an independent cavalry brigade or division to which a zone of country has been assigned for reconnaissance, to bear in mind the necessity of being able rapidly to concentrate the whole available force.

(3.) That in order to effect this object, it is absolutely necessary to avoid a too great dispersion of the force at disposal, and that the extent of country assigned for reconnaissance to a body of cavalry should be as far as practicable proportioned, both in depth and breadth, to its numerical strength.

(4.) That when it is deemed advisable to send out Officers' patrols or scouting parties far ahead of the advanced guard, these patrols should not be fettered with the obligation of taking measures to provide for the security of the troops in rear. If on the march, that duty must devolve upon the regularly formed advanced guard. If the force is stationary, as, for instance, when halted for the night, the duty of securing the safety of the force will naturally be undertaken by the regular outposts.

(5.) That as soon as the enemy is found, and the main line of his advance has been ascertained, the division or brigade should contract its front so that a concentration may be effected in good time.

(5.)

The Organization of a Pursuit.

One of the most difficult tasks which can fall to the lot of a cavalry division is to regain the lost touch of the enemy, either when he may have changed his plan of operations, or when, either after a defeat, or before a decisive battle, he makes a secret and sudden retreat. The difficulties of the task in this case are naturally greater or less in proportion to the ignorance which exists as to the routes which may have been taken by the enemy. For instance, the German cavalry had the greatest difficulty in 1870 in refinding the army of Marshal McMahon, when the "touch" of that General's forces was lost immediately after the battle of Wörth, and when the shattered débris of his army escaped towards Champagne by the defiles of the Vosges, the Moselle, the Meuse, and the Marne. Two divisions of cavalry, and afterwards four, were ordered to regain the touch of this army.

For a long time utter uncertainty prevailed as to the route which General de Failly's corps had taken; and yet the traces which this corps had left in its track were numerous, the population of the country had shown no disposition to resist, and from the Vosges to the Marne, as also subsequently in the Argonne and in Champagne, the German reconnoitring parties met with a most insignificant resistance. In other words, everything was in favour of the German cavalry.

When, as has often happened, the combat has been prolonged till nightfall, and when at the moment when the last echoes of the artillery fire die away,

there has been no opportunity of forming any clear idea of the exact situation of the enemy, it is often absolutely necessary to wait till morning in order to find out how matters stand, so that any further decisive measures may be based on the actual state of affairs. If on the morrow the weather happens to be foggy or misty, there arises a new difficulty in addition to those already existing, and very often the favourable opportunity for a pursuit will have passed away, ere it is possible to see that the enemy has completely evacuated his position, and before any idea can be formed by an actual examination of the battle-field of the extent of the defeat inflicted upon the enemy.

Favoured, then, by the darkness of the night, the enemy has avoided a direct pursuit by a forced march. But in what direction has he gone? That is the question to be solved first of all. It is upon the cavalry that the solution of it devolves, and they must first of all regain contact with the vanquished foe.

It was thus that matters generally stood at the end of the greater number of the battles fought upon Austrian and French soil in 1866 and 1870-71, and especially in the case of those contests which were interrupted by the darkness of the night. After the battles of Königgratz, Wörth, Spicheren, Orleans, Amiens, St. Quentin, and other minor engagements more or less serious, the conqueror completely lost contact with the enemy. After the battle of Königgratz, this contact was not completely established till the sixth day; after the battle of Wörth, contact was, it is true, regained the next day, owing to the pursuit of the 4th Cavalry Division and some detachments of Bavarian cavalry; but in the evening of that day all traces of the French were again lost, so that, as already mentioned, the Germans remained a very long time in utter ignorance of the direction followed by the shattered remnants of McMahon's army (which had avoided pursuit by making forced marches during two successive nights), as also of the direction of the retreat of De Failly's corps. After the battle of Spicheren, the Germans also lost all contact with the enemy, who had withdrawn during the night. This contact had then to be regained, which was not done till two days later.

In winter campaigns, when the beaten army can make use of the long nights to carry out its retreat in secret, and the victor can only carry on the pursuit during the comparatively few hours of daylight, there will most frequently be seen that which has just been described, viz., complete loss of contact, and great difficulty in regaining it.

The army, then, which has been favoured by the fortune of war, and which sees night coming on before there is any decisive issue to the conflict, ought not to let its cavalry remain inactive, even during the night. On the contrary, all the cavalry, reunitied on the field of battle, should be pushed forward on the main roads, so that, in the event of a pursuit being determined upon, it should hold itself ready in close proximity to the most advanced position occupied by its own army, to launch forward its forces at daybreak in pursuit. During the night Officers' patrols should endeavour to gain news of the enemy's movements, especially by pushing forward on those roads which it is probable he would make use of in case of a retreat.

This assembly of the cavalry towards the close of the day, or during the obscurity of the night, is on battle-fields of any great extent by no means an easy task. Nevertheless, every effort must be made to effect this difficult work, so as to get the cavalry together in good time; and it is also necessary that the cavalry itself should be equal to the occasion, if it receives orders to betake itself, in spite of the darkness of the night, to a different point from where it has been engaged during the day, or despite the fatigue and exhaustion of men and horses, either to keep on the enemy's track, or to refind it if it has been lost.

The Officers entrusted with the command of the different bodies of cavalry ought to remember that upon their arm devolves the task, without any formal

order, of preserving contact with the enemy, and of unhesitatingly undertaking his pursuit. They should therefore give directions upon their own responsibility for all that is necessary to obtain this double object, and should without any delay, at the close of a battle, send their staff and orderly Officers to the Commander-in-Chief, in order to inform him of the position in which the cavalry may happen to be, and of the measures which they have taken in anticipation of an active pursuit, as well as to ask for fresh instructions.

The commanders of the cavalry posted on the wings of the line of battle should specially endeavour to carry out the directions just detailed, inasmuch as the Commander-in-Chief has a right to expect that these Officers will take all possible measures to obtain verbal instructions.

The cavalry posted on the wings of the line of battle should seek during the night to anticipate, and to reconnoitre the routes on which the enemy will probably retreat. As long as these routes are more or less encumbered with the enemy's troops, it will be sufficient to employ Officers' patrols to watch them, and to keep up the contact ; on the other hand, should the enemy have made good the retreat so that the roads are clear, and afford no definite clue, they should be employed by complete squadrons, which should push on their investigations as far as necessary, and should leave posts of communications behind them as they go on.

When these squadrons are able to ascertain definitely that the enemy is in retreat, and have found out the route or routes he has taken, they should not cease to follow him up as long as circumstances will permit them to do so. Meanwhile the main body of the cavalry keeps up communication with these detached squadrons, and sends them reinforcements in case they are in want of them. As a rule, however, it should not follow on till daybreak. Less fatigued than the troops which have been employed in discovering the line of the enemy's retreat, the main body of the cavalry will be able to render better and more effective service during the day, and to take the lead as soon as the real pursuit begins. Thus pursuit will be all the more energetic and tenacious, if the strength of the men and horses have been husbanded during the night.

In any case, it will generally be upon the small scouting patrols that the most fatiguing work will devolve during the night, as it is their duty to maintain the actual contact with the enemy. In spite of the many difficulties with which they have to contend, such as that of ascertaining what is taking place in the darkness of the night, the danger of being completely lost in a strange country, &c., it is more than probable that at least some of the numerous patrols sent out will accomplish the end in view.

There are cases, however, when, in spite of the activity and skill with which the scouting patrols may carry out their work, they are liable to be completely baffled, and unable to effect anything beyond a certain point. This is especially the case when they find themselves stopped by a natural obstacle, which it is impossible for them to cross, such as a river, the passages of which are either held, or have been completely destroyed by the enemy.

It was thus, for instance, that on the 28th November, 1870, at the close of the battle of Amiens, the German cavalry was unable to discover the direction followed by the French in their retreat beyond the Somme. It is true that the nature of this river permitted the scouting parties to reach the different points of passage, but it prevented them from going any further, as it was impassable, and the bridges had been completely destroyed by the French.

When a retreating foe, in spite of all the vigilance of the conqueror, or in consequence of his negligence, has made good his retreat, and the cavalry force sent in pursuit has not yet been able, from various causes, to come up with or regain contact with it, *i.e.*, when all traces of it have for the time been lost, the scouting parties ought especially to make it their business to gather together all materials necessary for gaining a due appreciation of the

position of the enemy, by getting possession of the most recent journals and papers at the postal and telegraph offices, by questioning the inhabitants, &c. Wherever a strong patrol, a troop, or a squadron, arrives at any place, the first visit should be to the telegraph office, in order to carry off the register of messages sent and received ; to the post office in order to get possession of the letters ; to the railway station to get possession of all documents connected with the traffic, and with the recent dispatch and arrival of trains ; to the prefecture or sub-prefecture to examine any papers which might have reference to the movements of troops. When the exploring detachments were strong enough, and as soon as they had ascertained that no enemy was present in the place, this work was, in the campaign of 1870, divided by the German scouting parties, and a descent was made simultaneously on the railway station and the post office.

In organizing a pursuit, the first instructions issued relative to this operation ought, in general, to embrace the following points, viz., a brief *r  sum  * of the successful results of the fight and the general direction of the enemy's retreat ; a few words vividly depicting the advantages to be reaped from a vigorous pursuit, and which should tend to reanimate the exhausted energies of the troops. Finally, a brief explanation of the main objects which it is desired to attain by this supreme effort. After this should follow :—

1. Instructions for the cavalry divisions launched forth in pursuit of the enemy on the different roads. These instructions should clearly specify what destruction should be made of telegraph lines and railways which run to the rear or flanks of the enemy ; they should direct the cavalry division to sever the connection of the main line upon which the enemy may be found to be retreating, with any branch lines, in order to render easier the capture of the rolling stock, &c. In certain circumstances the cavalry will, moreover, be charged to prevent the enemy from carrying out any works of railway destruction.

2. The designation of a sufficiently numerous body of pioneers, who sometimes have to accompany cavalry columns in order to carry out special tasks ; also the designation of infantry detachments who ought to follow the cavalry without delay in order to support it. These latter and their equipment should, whenever practicable, be mounted on carriages.

3. Designation of any special tasks which it is expected that the cavalry commander will carry out.

4. The indication of the place where the army head-quarters will provisionally be established, and also the points to which the cavalry detachments advancing along the different roads will send their reports *direct*, and from whence they will take their orders up to a fixed hour. This is generally noon on the first day of a pursuit.

5. Arrangements for fresh supplies of ammunition and stores.

6. The place to which the pioneers should be sent.

Captain Von Widdern discusses at some length the measures to be taken for efficiently carrying out a pursuit. With regard to the part which the cavalry should play in it, he remarks as follows :—

" Masses of cavalry should be concentrated on the route on which to all appearance the main body of the enemy is likely to be met with. As many batteries of horse artillery as possible should accompany the cavalry, and if circumstances admit of it, some companies of infantry carried on carriages and abundantly provided with cartridges, as was done repeatedly with success during the campaign of 1870-71. It is, moreover, desirable that the cavalry should be accompanied by an Officer of the Head-quarter Staff, who should fulfil the functions of official reporter. With regard to the other roads, they should be scoured by small detachments, such as regiments, squadrons, strong patrols commanded by Officers, &c.

" The strength of these bodies must vary in proportion to that of the

"whole cavalry force employed. In all cases the addition of some guns to the pursuing force is most useful; the mere appearance of artillery always produces the greatest effect upon an enemy overtaken in full retreat, and perhaps also in a state of utter disorder; it tends also to give the pursuing cavalry force greater completeness and prestige, and to encourage its audacity. It may be added, also, that if any fresh engagement should take place with a considerable body of the enemy's troops, the firing of the guns acts as a guide to any bodies of the pursuing force who may be advancing by parallel roads.

"It is very important to send frequent reports to head-quarters, which ought to be at some fixed point, and to follow at a certain distance in rear. 'Negative reports,' i.e., those indicating the points where the enemy has *not* been met with, or the routes on which no traces of his retreat have been discovered, are no less important than other reports. It must not be omitted to attach to each report a return of the number of prisoners made up to the very hour of sending off the report, showing the branch of the service, and the corps to which such prisoners belong.

"The commanders of the cavalry march with their main columns, and after notifying in a cursory fashion to Army Head-quarters the most important facts that have been ascertained, and results that have been achieved by the pursuit, they will at their first halting place furnish a daily detailed report of all that has taken place. The circumstances of the moment must decide if the Officer of the Head-quarter Staff, who has been detailed as official reporter, is to return the same evening to Head-quarters in order to report verbally his views, and to recount the facts which he may have observed."

The same author also discusses the case already supposed, i.e., when, after a defeat or before a battle which is imminent, an enemy is forced, or thinks it prudent, to make a rapid and secret retreat. He gives the following as a specimen of the orders and instructions which might be issued to a pursuing cavalry force of two divisions under such circumstances:—

"The first cavalry division will endeavour to-morrow morning to re-establish the touch of the enemy.

"With this object the main body of the division will proceed in the direction of A, smaller detachments will proceed towards B and C, and will act so as to press the enemy very closely.

"The cavalry will also ascertain whether scattered fragments of the enemy's forces have escaped by way of Z.

"The second cavalry division will immediately advance with all its forces in the direction of E, passing by D. The Commander-in-Chief wishes to lay especial stress upon the importance of reaching the bridge of E before to-morrow evening, in order that its destruction may be prevented by the enemy. On the other hand, it is necessary that the enemy's communications with the fortress of F should be interrupted. In order to be able to maintain possession of the said bridge the division will be supported without delay by a battalion of chasseurs, for whom carriages will be provided.

"With regard to the further movements of the second division, after having ensured the possession of the bridge at E, it will endeavour to gain the left flank of the enemy's column of march, and will do its utmost to destroy the railway near H, which the enemy will doubtless endeavour to reach in order to use it for the transport of his troops. It is of the greatest importance to capture the rolling stock of this railway.

"Prisoners will be conducted to P.

"The head-quarters of the army will proceed to-morrow provisionally as far as M, to which place the commanders of the different pursuing columns will send their reports direct up to noon, and eventually by

" relays of orderlies. By the same agency they will receive the orders sent " out to them.

" Officers of the Head-quarters Staff will be attached to the cavalry " divisions, in order to send in reports to army head-quarters on the " general situation of affairs.

" It is extremely important that the pursuing force should not delay to " make known the roads upon which *no* traces of the enemy have been " met with."

When the enemy has at his disposal, immediately in his rear, a line of railway which he can reach in a march, or at any rate in a few marches, the victor engaged in the pursuit should strain every nerve to prevent his making use of it to facilitate his retreat. It is therefore of the utmost importance that the victor's pursuing columns should without the smallest delay reach the probable point where the retreating foe will first reach the railway. These columns should be of considerable strength, and be composed of the three arms; cavalry detachments should also simultaneously be sent forward, accompanied by pioneers, to destroy or temporarily render *hors de service* any lines by means] of which the enemy, if he once succeed in carrying off his forces by embarking them on the railway, can escape in a lateral direction.

It may be observed that a pursuit carried out exclusively by cavalry, with the object of immediately gaining contact with an enemy who has secretly withdrawn his forces,¹ or even any pursuit carried out, only by cavalry, unsupported by infantry columns,² will seldom lead to a success of any real importance.

In a pursuit, the direction which will ensure the most decisive results will always be that which tends to push the enemy off the line of communication which connects him with his base of operations, and from his sources of supply. The Franco-German campaign offers two memorable examples of the consequences to an army of being thus driven from its lines of communication. In January 1871, after several defeats, the army of Bourbaki was driven into Switzerland. Previous to this, the army of Bazaine, beaten at Spicheren and Colombey-Nouilly, was pushed off its line of communication with Chalons.

The troops which in an engagement have taken an active part, directly conducting to the retreat of the enemy, will rarely have an opportunity of following him up during his retreat otherwise than in a frontal direction. On the other hand, other fractions of the army, such as the cavalry, from their position with regard to the enemy's line of communications, will often be in a position to co-operate with other troops, so as to drive the adversary from his base of operations.

An indispensable condition towards effecting this result consists of quickly notifying all important intelligence to the other bodies of troops which may be co-operating in the pursuit, and prompt use should be made by the cavalry of orderlies, or, if necessary, of small parties for this purpose.³

(6.)

Continental Cavalry Manœuvres in 1879.

In order to give a general idea of the cavalry manœuvres which are annually practised in Continental armies, I propose to give a brief *résumé* of those

¹ E.g., The pursuit after the battle of Wörth.

² E.g., The pursuit after the battle of Orleans.

³ The dispositions of General Goeben for carrying out an energetic pursuit of the French after the battle of St. Quentin, in January, 1871, may be quoted as an example of what can under adverse circumstances be done.

which took place in the French, German, Austrian, and Russian armies in the autumn of 1879.

Of the great cavalry manœuvres of the above year, I will first deal with those which took place in the environs of Paris in September, 1879, and which attracted a large number of visitors.

The French Cavalry Manœuvres of 1879.

The programme of these manœuvres was as follows :—

As a preparatory measure there were assembled in the department of the Seine and Marne, the first cavalry division (one brigade of chasseurs, one of dragoons, and one of cuirassiers), under the orders of General Thornton, at Rebais ; and the 4th cavalry division (one brigade of hussars, one of dragoons, and one of cuirassiers), under the orders of General Espouilles, at Nemours. From the 4th to the 13th September these troops practised a progressive course of exercises with the several tactical units, from the squadron to the division. Then began the manœuvres of two divisions operating one against the other. The direction of these manœuvres was entrusted to the General commanding the 9th Corps, the Marquis de Gallifet. The general idea adopted by this Officer was as follows :—General Thornton was instructed to cover the advance of an invading army which, having arrived in the valley of the Marne by the various issues leading out of Champagne, had formed the resolution of marching upon Paris by the valley of the Oise. In order to carry out this scheme he had to direct his march upon Ferté-sous-Jouarre. General d'Espouilles was opposed to him, and was sent by a hostile army established at Orleans to watch the operations of the army, whose presence in the valley of the Marne had become known. Hence it will be seen that the chief task of the 1st Division was to form a screen, and that of the 4th Division to break through it.

At the beginning of the manœuvres the distance between the two divisions was 90 kilometres (about 50 miles). It was necessary, therefore, before doing anything else to bring them into contact with each other. In order to do this, and to prevent the troops from marching at random, General de Gallifet prescribed the movements to be made so that they should come into contact on the 15th September. During the next four days manœuvres à double action were practised. Here, again, in order to bring about the greatest possible number of encounters, and those, moreover, on the most favourable ground, movements were prescribed in the most minute detail, down to fixing the very hour of encounter. This was carried to such an extent that no initiative whatever was left to the commanders of the two opposing sides, inasmuch as the issue of all orders of any moment was reserved to the supreme authority. As these orders, moreover, were given much too soon, and as the subordinate commanders issued their instructions as soon as they received them, the result was (as was remarked in the "Spectateur Militaire")¹ that it was known long before that such or such a regiment would on a certain day defend a certain ford, &c. Another result was that these minute and detailed instructions often entailed counter-orders, and thus produced disorder. Much useless labour, moreover, was expended in drawing them up, transcribing and issuing them, and finally the troops were unnecessarily harassed and fatigued.

General de Gallifet profited by this occasion to issue detailed instructions on the subject of scouting, reconnaissance, and outpost duty, the employment of artillery, and several other subjects. Finally, he availed himself of these manœuvres in order to test a "projet d'instruction sur le service d'exploration de la cavalerie en campagne." This plan, which he had drawn up by order of the Minister of War, and introduced on trial into the IXth

¹ See Livraison of October 15, 1879.

Corps, seems destined to replace the regulations of 27th June, 1876, which are actually in force, and to which reference has already been made.

That great interest was taken in these manœuvres, and that the lessons to be learnt from them were closely studied, was abundantly shown by the space devoted to them in the French military periodicals and papers of the time, in whose pages they were closely scrutinized and discussed.¹

The encomiums bestowed upon the cavalry were generally confined to reasonable limits. "L'Avenir Militaire," in its praises, began with the private soldier, but did not go further than the Captains. The "Spectateur Militaire" was willing to admit that the Colonels were worth something, but it attacked the Generals of Brigade with the utmost violence, and, moreover, repeated *verbatim* the severe censure which General Espouilles expressed to the division on several matters. But on the whole the general verdict was that the French cavalry had learnt much, and that it was animated by a sincere desire to learn and improve itself more. It was admitted on all hands that manœuvres, continual manœuvres, were the chief desideratum, and that it was necessary that every division should have an opportunity annually of carrying out manœuvres extending over a certain time. It was thought, also, that this was equally necessary for the brigades of divisional cavalry. The service of scouting and reconnaissance was carried out, as has been already mentioned, in accordance with a new system which was introduced on trial.

The regulations officially prescribed in "L'instruction sur le service de la cavalerie éclairant une armée" had fallen into complete disrepute. They were condemned as being too formal, as being inapplicable in many cases, and as causing a too great dispersion of force. What a cavalry division is required to do when covering the advance of an enemy is above all to see well. Consequently it has to put forth its "antennae" far ahead and yet retain the power of rapidly concentrating in order to fight the enemy. As these are the conditions to be fulfilled, the proposition has been mooted of separating completely the service of scouting and reconnaissance from that of outposts, ("le service de sécurité"). For reasons already explained it will nearly always be found necessary on active service to separate these two services.

During these manœuvres the normal plan adopted for carrying out the service of scouting was as follows:—The two regiments of a brigade marched side by side, and each of them detached a squadron ahead, which distributed its four pelotons over the front of the brigade. Each peloton sent a party (or "point" as it is called in the French cavalry service) about 800—1,200 yards ahead. This party or "point" consisted of four or six men, according as non-commissioned officer or Officer commanded it. This plan pre-supposes numerous roads or a country which is especially practicable for cavalry. Moreover, in wishing to avoid a too great dispersion of forces, it makes the "antennae" of the force so weak that they would never be able to reconnoitre a country which was at all hilly or broken.

During these manœuvres, so prodigal a use was made of "Officers' patrols," that the efficiency of the regiments was thereby impaired.

With regard to fighting on foot, though a true estimate has been taken of the value of this practice by the French military authorities, and although it has been officially limited to certain conditions, yet it was nevertheless during these manœuvres too frequently resorted to. On several occasions, however, the opportunity was rightly taken of using it with success. This was notably the case on September 18th, when the chasseurs, pursued by some dragoons, who were paying no attention to reconnoitring the ground ahead of them, were opportunely checked by the fire of dismounted men. Theoretically, however, it seemed to be thoroughly understood that it would be a mistake to

¹ See "Moniteur de l'Armée," 1st October; "L'Avenir Militaire," 6th October, "Spectateur Militaire," September—November, 1879, &c.

suppose that this mode of fighting could have an excessive influence on the action of cavalry. Fighting on foot is chiefly to be recommended in the case of a retreat, and yet it ought not to be so stubbornly maintained as to prolong resistance too much, if one does not wish to run the risk of having one's retreat cut off. Cavalry fire ought always, if possible, to surprise the enemy ; it should never degenerate into a sustained fusillade, and in no case ought the mounted attack to be delayed by it ; nor ought it to prevent the cavalry having recourse to the sabre.

For offensive purposes it should never be resorted to, when there is any possibility of attaining the object in view in any other way.

Such is a summary of the rules prescribed for, and the views generally entertained by the French cavalry on this subject ; which will, I think, be acknowledged as being generally sound.

The part played by the horse artillery attached to the cavalry in these manœuvres was severely criticized, and the two arms were recommended to acquire a closer acquaintance with each other. On some occasions it was said that movements were skilfully carried out with the object of gaining shelter from the enemy's fire ; but, on the other hand, the contrary was often the case, and many times the cavalry, under the impression that it was right to give the artillery ample opportunity of first producing an effect with its fire, carried this idea too far and let slip the chances of success which a prompt attack would have given.

With regard to the escort of the artillery, in addition to the special duties entrusted to it, General de Gallifet laid great stress upon the importance of its carefully reconnoitring the ground with a view to the special requirements of horse artillery.

Austrian Cavalry Manœuvres of 1879.

The Austrian cavalry manœuvres of this year, which took place at Bruck, on the Leitha, were carried out by the 2nd Cavalry Division (four regiments of six squadrons, one of four squadrons, and one of two squadrons), in all, 4,526 horsemen, and two horse artillery batteries of six guns, under the supreme command of the Inspector-General of Cavalry, Field-Marshal Count Pejacsevitch, and they lasted from August 23rd to September 6th. The majority of the troops were quartered in the permanent camp, and the rest in cantonments. This method of sheltering the troops, entailing as it does the necessity of manœuvring over a perfectly well known country, presented all the petty advantages and the great drawbacks which are inseparable from permanent camps. It is owing to these drawbacks having been so greatly felt that the wish has been expressed in Austria, that the plan adopted in Germany for the carrying out of manœuvres might be generally followed.

All these Austrian cavalry manœuvres were carried out à *double action* except those of the first day, when the enemy was indicated by a squadron. The Commanders of both sides on the evening before received printed programmes which made them acquainted with the object of the manœuvres, the general idea, the special idea, and the situation of affairs at the beginning of the day's work. The umpires received instructions containing suppositions as to the probable course of the movements which would be carried out. But these instructions were always kept secret until the termination of the day's work, and were only made use of by the umpires to guide them to the points where their own presence would probably be necessary. They were only made known when the day's manœuvres were over, and they then served to render the latter more instructive by comparing the movements actually carried out with the calculations of the superior authorities. With this programme for a basis, the Commander of each side had on the evening

before to draw up the necessary orders, and to communicate them to the troops under his command. In these orders he had to indicate the composition of the different columns, the routes they were to take, the object they were to hold in view, and to point out by what means the columns were to maintain communication with each other, as well as with himself and his staff, &c.

In order to render these manœuvres as instructive as they ought to be, *i.e.*, really manœuvres, and not merely parade exercises, orders were given each day that the troops of each side should start at a great distance from each other. This often necessitated marches of 15, 20, and even 30 kilometres (9, 12, and 18 miles) being made to get to the starting place, and then, of course, the troops had in addition to the fatigues of the manœuvres to return home, so that the endurance of men and horses was put to a considerable test. Thus, for example, on the 29th August, the 8th Regiment of dragoons, in addition to the ground gone over during the course of the day's manœuvres, had to march 60 kilometres under a broiling sun.

The object of the first day's manœuvres, which were directed against a marked enemy, was to concentrate the division which was marching in three separate columns on the head of the centre column. In other words, the division being occupied in making a simple march ahead against an enemy believed to be weak, it was suddenly found necessary, owing to an unexpected change in the aspect of affairs, to effect a concentration of the division. Various calculations of time and distance had then to be made to enable this movement to be carried out without harassing men and horses unnecessarily and as rapidly as possible. The execution of this manœuvre showed that it is advisable in actual practice to allow for the hitches and delays, which, in theory only, have no existence, and that it is far better in an unknown country to keep to the roads than to go galloping across country.

The tactical object of the manœuvres, which took place on subsequent days, when two sides were opposed to each other, was to exercise the cavalry in every phase of duty which on active service would be likely to fall to its lot; the composition of the two sides was varied, as the neighbourhood of the camp at Bruck enabled either infantry or an additional force of artillery to be added to either side. This tended to diversify each day's work without in any way taking away from the manœuvres their characteristics as exercises for cavalry.

The first day's work for each of the two sides was to march out of camp and dispose in order of march a great mass of cavalry. The second day the stronger side had to carry out the service of reconnaissance and scouting, and the weaker side, reinforced by a battalion of chasseurs, had the task of forming a screen so as to hide the movements of an army in rear. A reconnoitre between the opposite sides was the main feature of the manœuvres of the third day. On the fourth day, the stronger side acted as the support of a wing which the weaker side had to attack while it was marching. The fifth day there was a representation of an episode in a pitched battle. Finally, the sixth and seventh days were devoted to combined manœuvres of the three arms, in which infantry and artillery on a large scale took part.

Major Dembshen, an Austrian Officer, wrote an article on these manœuvres, which was published in the December number of the "Austrian Military Review of 1879." To it I am indebted for most of the details that have here been given. The author states that a considerable improvement was to be noticed in the performance of scouting, reconnaissance, and outpost duties, especially in the matter of gaining information; on the other hand, he censures the squandering and too great depression of forces in the performance of some of these duties, and lifts up his voice against the too lavish use that, in the Austrian as well as in the French cavalry, is made of Officers' patrols; a practice which in both armies seems to be abused. He recommends that a vigorous distinction should be drawn between the services of

ordinary scouting and outpost duty, and those of Officers' patrols, inasmuch as at present these duties often encroach one upon the other; and he is of opinion that a special *service d'informations* should only be set on foot when the distance from the enemy is found to be so great that it is not possible for the scouting to be carried out by the troops who in the ordinary course of things would be charged to carry out that duty.

The German Cavalry Manœuvres of 1879.

The cavalry manœuvres which were executed at Namslau, in Silesia, under the command of Major-General von Alvensleben, by a mixed division of Prussian cavalry (two regiments of cuirassiers, two of hussars, and three of uhlans), strengthened by two batteries of horse artillery, served to illustrate a combination of two systems. The one which has become habitual almost exclusively in the German army consists in operating against a marked enemy. The other consists in having two opposing sides manœuvring against each other. This latter method was, as already shown, practised in 1879 in France and Austria. In Germany, however, in that year, it was the former system, viz., manœuvres against a marked enemy, which was most practised.

When the regiments had had the usual preliminary practice in brigade drill, two days were devoted to manœuvres which were intended to illustrate the employment of the brigades as the three lines of a division. There were then two days upon which the division was considered as an independent cavalry division, and also one day when it had to take its part in line of battle.

On these last two days, each regiment was formed in rank entire, an arrangement which afforded a great number of Officers an opportunity of practising the discharge of the duties of a higher grade than their own. Great efforts, moreover, were made to make the manœuvres as instructive as possible in every respect. The marches to and from the scene of the manœuvres were all carried out in every respect as in time of war. The regiments marching from different quarters had orders to oppose one another on their entry in the zone of cantonments. On only one occasion, however, did one regiment succeed in surprising another on the march. Finally, during several days, the programmes were so arranged as to oblige isolated detachments on each side to look for and attack each other.

A special feature of these German cavalry manœuvres consisted in having attacks carried out by the whole division against long lines of infantry marked out by flags and by dismounted men, against masses of artillery indicated by some guns. In accordance with instructions issued by the Commander of the division at the beginning of the manœuvres, these attacks were executed always by échelon of squadrons. For instance, two brigades drawn up in this formation would charge together, while the third brigade of a division was employed as the circumstances of the case seemed to require. In these instructions great stress is laid upon this method of attacking artillery either in front, flank, or rear, according as opportunity may offer.

The Russian Cavalry Manœuvres of 1879.

It may be remembered that in the autumn of 1876 a great progressive step was made by the Russian cavalry towards developing and improving at annual manœuvres the practice of the duties which would in real warfare fall to its lot to perform. In the above year the Russian military authorities decided to give to two large opposing bodies of cavalry a zone of operations amply sufficient, both in depth and width of front, to afford full scope for reconnoitring skill, for secrecy, for rapidity, and for marching powers. Upon the leaders of each side, moreover, was imposed a task precisely similar to

that which the cavalry of any great Power might, in the event of an outbreak of war with any of its neighbours, have to perform.

These doings of the Russian cavalry, which took place in the neighbourhood of Warsaw, attracted a great deal of attention in the neighbouring Continental armies, and that for several reasons. Firstly, it was the first instance in Europe in which a large cavalry force engaged in manoeuvres attempted to undertake a "raid" after the American fashion, against a far distant point of the enemy's communications. Secondly, the area or zone over which the operations extended was both in depth and width of front an unusually large one, and therefore amply sufficient to afford full scope for the display of strategic skill and ability on both sides. Thirdly, an entirely new feature was introduced on this occasion, in order to aid the troops, and to give the whole affair as much *vraisemblance* as possible to real warfare, viz., the co-operation of the whole of the civil and local officials on both sides.

By way of following up the idea which had thus been carried out in 1876, arrangements were again made in the autumn of 1879 for strategical cavalry manoeuvres on a large scale. On this occasion, during the earlier part of the manoeuvres, the task which devolved upon one side was to protect the mobilization of a large force, while the object of the opposing side was to disturb and prevent it. The general idea was that a division of cavalry stationed at Goldap and Gambennen (on the east Prussian frontier) was to try to prevent and disturb a mobilization of (Russian) troops which had already begun in the district of Sawalki, while a force of equal strength which was in that district was, with the aid of the local garrisons, to oppose and frustrate this attempt. After a contest of eight days the district of Sawalki was occupied by the enemy. A fresh idea was then put forth, viz., that the invading party was to push ahead, and the other side was to defend the line of the Boba, a small river which flows through the eastern side of the district of Sawalki. To dwell, however, in detail upon the execution of these manoeuvres would carry me further than the limits of this paper allow.

While on the subject of the Russian cavalry manoeuvres it may be interesting to note the instructions which Lieutenant-General Gourko issued with reference to the cavalry at manoeuvres at the camp of Krasnoe Selo in this same year, where the command was entrusted to him. He directed that the march of the cavalry each day to the place of assembly was to be from 10 to 15 versts ($6\frac{1}{2}$ to $9\frac{1}{2}$ miles) in order to give them ample opportunity of practising all precautions necessary on the march, the rate of march, moreover, was to be as a rule not less than 10 versts an hour, and that no ground was to be thought impracticable for cavalry except steep slopes and marshes. Finally, he strictly enjoined the use of the three-line formation in tactics.

The following order of the late Emperor, communicated by the General to the troops of the Guard and of the military district of St. Petersburg, at the end of the manoeuvres at the camp of Krasnoe Selo, would seem to show that the *élite* of the Russian cavalry have, like some of their neighbours, much to learn : "Generally speaking the cavalry has shown but little proficiency in scouting and reconnoitring ; communication between the different columns was badly maintained, and the contact or touch of the enemy was often altogether lost. It has also happened sometimes that, up to the end of the day's manoeuvres, the chiefs had received no positive information regarding the position of the enemy, and that the commanders of the different columns were ignorant both as to the whereabouts of the columns nearest to them and of what was going on in their immediate neighbourhood. It is necessary to bestow far more care on the subject of scouting and reconnaissance, a matter to which attention was specially drawn in the order of 1st May. Until the efficient performance of this duty has become habitual in the cavalry, that arm will not be able to fulfil one of its most important functions, viz., that of being the eyes and ears of the army."

It will be seen by the cursory sketch which has here been given of the various cavalry manœuvres which took place in the four chief Continental armies in 1879, that it is usual to employ large bodies of cavalry on these occasions chiefly in two ways. One of these methods is to oppose one body against another of about equal strength, and the other is to manœuvre them against a "marked enemy." When the former method is adopted, great pains are taken to exercise the cavalry over a wide extent of country, because it is justly held that the most essential condition for affording useful instruction to the cavalry arm is a zone of operations of sufficient front and depth for the practice of the various duties which in actual warfare they would have to learn. When the two brigades or divisions which are to oppose each other are separated (as often happens in Continental manœuvres) at the outset from 50 to 80 miles¹ of country which is strange to either side, and they have to work up to each other, during two or three days' work the work to be done, if carried out with ordinary zeal and ability, can hardly fail to be instructive to all concerned. I fear that in England we can never, for well known reasons, hope to have the benefit of such excellent practice as this. Even at Aldershot, the area of operations is always so restricted as greatly to mar the practical usefulness of any manœuvres of this kind, and cause them to fall far short of what might under more favourable circumstances be made of them.

The second method adopted, viz., that of manœuvring against a supposed enemy, marked out by flags and skeleton bodies of troops, has always been much practised in the German, and in a lesser degree in other Continental armies. The chief merit of this system is considered to be that it enables useful instruction to be given, not only to the leaders and higher Officers, but also to all the subordinate ranks, by enabling every man clearly to realize the position of the enemy, and to understand the meaning of each manœuvre which is made to oppose him. How far this expectation is fulfilled is, I think, in many cases a matter of some doubt. It may be observed, moreover, that when a marked enemy is made use of, the cavalry is generally employed in tactical exercises and evolutions having for their object the practice of fighting and manœuvring in large masses. These manœuvres are in all Continental armies carried out on the principles which were first prescribed some eight or nine years ago by General Von Schmidt for the Prussian cavalry.

Apart from these exclusively cavalry manœuvres, there are naturally many occasions in which a considerable force of cavalry forms part of a large force, such as an Army Corps, which is pitted against a similar body of troops. This was the case last year (1880), at the Imperial manœuvres at Berlin, when the IIIrd Army Corps was opposed by the Guard Corps. To each of these forces a cavalry division belonged. Here the propinquity of the two armies to each other excluded all idea of reconnoitring and scouting on the part of the cavalry, but the two divisions practised through their whole extent the duties which would devolve upon them upon the actual battle-field. To enter, however, here upon a detailed account of the part played by the cavalry in these manœuvres would carry me beyond the limits of this paper.² It must here suffice, in conclusion, to remark that those who care to note the efforts made year by year by the cavalry of Continental armies to develop the capabilities of the arm, can hardly fail to be struck with the progress which has recently been made.

¹ For instance, at the Austrian cavalry manœuvres which took place in Galicia, last year, the contending forces started from points 80 miles apart.

² For an interesting account of these manœuvres, and of the part played by the cavalry in them, the reader is referred to the "Revue Militaire de l'Etranger," No. 524, of April 1st, 1881.

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